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ABSTRACT

The overview of West Germany's educational system emphasizes administration, organization, admission criteria, objectives, and career training programs. The document is presented in five chapters. Chapter I focuses on various aspects of planning for and administering elementary, secondary, and higher education, with particular attention to (1) areas of jurisdiction, and (2) functions of various planning bodies. Chapter II describes general education schools, vocational schools, and special schools for students with physical, mental, and emotional handicaps. Chapter III focuses on vocational education outside the schools. Topics discussed include on-the-job training, vocational training centers, home training programs, employers associations, and chambers of commerce. Chapter IV specifies qualifications for admission to institutions of higher education. Various types of examinations and criteria are identified, including those which apply to foreign students and hardship cases. Chapter V examines types of higher education institutions, including universities, teachers colleges, art schools, music schools, junior colleges, and technical schools. The document concludes with appendixes presenting curricula of various programs, tabular information regarding structure of the educational system, and listings of degrees offered in various disciplines. (DB)

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The Educational System in the Federal Republic of Germany

U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
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College Entrance Examination Board
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Foreword to the American Edition

The search for equivalency among the world's academic credentials appears to be a preoccupation of many of those who favor the movement of students and scholars among nations. When Latin was *lingua franca* and theology, medicine, law, and philosophy the only disciplines, equivalency was a personal matter. Most universities taught the same material; there were few scholars and no appreciable language barrier.

It is not necessary to describe today's diverse, versatile education systems to bring home the fact that the acceptance of a scholar with credentials from an institution in one country by the institutions of another involves overcoming major hurdles. The occasional unwillingness of one department of a university to accept the credentials of another department in the same university is a relatively minor indication of the problems that the search for equivalency faces.

At the same time, the very mobility of large numbers of students and scholars lends to this effort increasing urgency. The German-American Cultural Talks of 1973 took note of this need and asked that the two governments appoint members of a working group to study the issue and provide as many answers as possible. This book is one outcome of their efforts.

It was agreed early in the deliberations that no easy "equivalency" could be established between levels of education in the two countries. What was needed were descriptions of each country's education system, written in the language of the other nation, to which the competent authority in the receiving country would add recommendations for admission and placement acceptable to the sending nation. In this description of the German education system the recommendations (page 51) were issued by the National Council on the Evaluation of Foreign Educational Credentials. The counterpart of this book is *Diversity, Accessibility, and Quality: A Brief Introduction to American Education for Non-Americans*, by Clifford F. Sjogren, which was published in both German and English (New York: College Entrance Examination Board, 1977).

The American team in the German-American discussions was made up of representatives of government and of the private sector. They included: Stan Berry, University of Washington; G. James Haas, Indiana University;

Charles Hauch, Office of Education (Department of Health, Education, and Welfare); Sanford C. Jameson, The College Board, and chairman of the National Council on the Evaluation of Foreign Educational Credentials; J. Boyd Page, Council of Graduate Schools; Albert G. Sims, The College Board; Clifford F. Sjogren, University of Michigan; Mary Ann Spreckelmeyer, Student Support Services (International Communication Agency); Raymond Wanner, Office of Education (Department of Health, Education, and Welfare); and Richard Straus, Educational and Cultural Affairs, Department of State (later International Communication Agency), *chairman*.

The German team was chaired by the former Ambassador Dr. Rudolf Thierfelder, as representative of the Foreign Office and included:
from the Standing Conference of the Ministers of the Laender for Education and Cultural Affairs: Leitender Ministerialrat Herbert Kraus, Senatsrat Dr. Otto Schieffer, Regierungsdirektor Dr. Horst Roche;
from the Federal Ministry of Education and Sciences: Frau Helga Lancaster;
from the West German Rectors' Conference: Herr Alan Smith;
from the German Academic Exchange Service: Frau Marianne Reichling.

Throughout the discussions helpful advice was received from Dr. Ulrich Littmann, executive director of the German Fulbright Commission, and Dr. Wigbert Holle, foreign student adviser at the University of Bonn.

One of the most difficult tasks in this undertaking was the translating and editing. Numerous individuals played important roles: Dr. Littmann and his wife, Dr. Ellen Littmann; Harry Obst and Mrs. Gisela Marcuse of the Department of State's Division of Language Services; Diane Olsen of the College Board. While all had a hand in preparing the document and deserve appreciation and credit, final editorial responsibility is taken by the chairman of the United States working group, and any errors or lack of clarity that remain are his responsibility. Mrs. Karon Martin deserves thanks for a great deal of typing and retyping.

We trust that the document will be useful and will provide an additional step in the goal set by the Final Act of the Conference on Security and Cooperation in Europe, which was concluded in Helsinki in 1975:

> "to promote a more exact assessment of the problems of comparison and equivalence of academic degrees and diplomas by fostering the exchange of information on the organization, duration and content of studies, the comparison of methods of assessing levels of knowledge and academic qualifications, and, where feasible, arriving at the mutual recognition of academic degrees and diplomas. . . ."

Richard Straus
January 1979

1. Legislation, Administration, and Planning in the Educational System

1.1 Summary of the Educational System

Compulsory education for all children in the Federal Republic of Germany begins at age 6. As a rule it continues for 12 years, made up of 9 years of full-time and 3 years of part-time schooling. (See Appendix 1.) After the preschool institutions *(Kindergarten, Eingangsstufe, Schulkindergarten)*, the educational system begins with an elementary school *(Grundschule)* common to all children, extending from first through fourth grade. This common elementary school serves as the foundation for general education secondary schools, i.e. *Hauptschule* (grades 5 through 9), *Realschule* (grades 5 through 10), and *Gymnasium* (grades 5 through 13). In addition, in all states there are *Gesamtschulen* (experimental comprehensive schools) extending from grades 5 through 10 (see section 2.1.6).

Grades 5 and 6 of all general education schools are designed to prepare and guide all students in their further education. To achieve this goal, the Standing Conference of Ministers of Education and Cultural Affairs has concluded an agreement uniformly introducing the so-called *Orientierungsstufe* (orientation level). With the introduction of the orientation level and the concomitant harmonization of the curriculums in grades 5 and 6 of all schools, the pupil's ability to transfer from one educational track to another has been vastly improved, and decisions as to the nature of further schooling have been deferred to grade 7. The orientation level can also be arranged as a separate stage independent of other schools (effective for instance in Bremen from 1977 on). Under this arrangement secondary school begins with the seventh grade.

After completion of grade 9 the majority of students transfer either to vocational training or to employment. Students completing grade 9 who choose not to continue their education in general schools *(Realschule*

or *Gymnasium)* must attend one of the various vocational secondary schools (compulsory vocational education) at least on a part-time basis and for a period of at least three years in addition to their vocational training or employment.

Realschulen and *Gymnasien* provide for an elective termination of education on the completion of grade 10 *(mittlere Reife)* enabling students to enter training to become skilled workers, enter the lower professional ranks, or transfer to a *Fachoberschule* (career-oriented upper secondary school).

Students in general education and vocational secondary schools may enter institutions of higher learning if they take certain specified courses and pass the required final examinations. On the completion of 12 grades students may enter the *Fachhochschule* (see section 5.1.5); on the completion of 13 grades, they may enter universities or equivalent institutions of higher learning. Institutions for continuing and adult education provide various forms of further study.

In the primary and secondary schools, students are usually grouped by age. Frequently, ability groups are formed from a specified grade onward (usually grade 5 or grade 7) in such subjects as language study, mathematics, and natural science. Decisions about promotion to the next grade, or failure and the need to repeat, are made on the basis of the achievement of each student during the course of the school year. The evaluation of students is made on the basis of marks and, in the so-called newly structured upper level of the *Gymnasien*, on the basis of an additional grade-point system (see section 4.1.2).

The curriculums of the various schools are determined by the Ministry of Education of the particular state *(Land)*. They are developed with the participation of teachers and experts either on the basis of guidelines or a framework worked out by the Standing Conference of Ministers of Education or on the basis of consultation among the states.

In institutions of higher learning courses of study are, as a rule, divided into semesters. Depending on the discipline, a course of study consists of from 6 to 13 semesters.

Career outlets differ according to study objectives. The successful conclusion of a program, therefore, may enable the graduate to enter further study in the preparatory service required of teachers, judges, and other civil servants or to enter directly certain kinds of employment (such as chemist, physician, psychologist, and business manager).

Attendance at all public educational institutions is free of charge. All necessary school supplies are either furnished without charge or lent to the student.

Under the terms of the Federal Education Assistance Act additional financial assistance is granted under certain conditions to students beginning with grade 11 in both general and vocational secondary schools

and to students in institutions of higher education. In the latter, financial assistance is limited to a period equal to the time in which the student's course of study can normally be completed. Financial assistance is granted only if the student's own income and property, or that of those legally responsible for his or her maintenance, are insufficient.

1.2 Areas of Jurisdiction

The Federal Republic of Germany is a federal state consisting of the states *(Länder)* of Baden-Württemberg, Bavaria, Bremen, Hamburg, Hesse, Lower Saxony, North Rhine–Westphalia, Rhineland-Palatinate, Saarland, and Schleswig-Holstein, as well as Berlin, which holds a special status under the Quadripartite Agreement.

The responsibility for educational policy and educational planning is determined by the federal structure of government. According to the Basic Law *(Grundgesetz)* of the Federal Republic of Germany only a fixed number and range of duties are attributed to the federal government, whereas the states have general responsibility for carrying out matters affecting public education.[1]

Accordingly, the states are for the most part responsible for educational matters. The legislative responsibilities of the federal government are primarily to enact a framework of general principles in higher education, and to provide for the advancement of scientific research, student aid, and nonacademic professional training and vocational guidance. The Basic Law provides for cooperation between the federal and state governments if certain duties that have been delegated to the states are of importance for the whole nation and if the cooperation of the federal government is needed for the improvement of the standard of living. Included under these collective duties in the field of education are the expansion of existing institutions and the construction of new institutions of higher learning, including university hospitals. Furthermore, the Basic Law provides for collaboration through agreements between the federal government and the states in the area of educational planning and the advancement of facilities and projects for scientific research of supra-

1. According to the Basic Law, Articles 30 and 70, the responsibilities and legislative powers of the states and the federal government are as follows:

Article 30. The exercise of governmental powers and the discharge of governmental functions shall be incumbent on the states insofar as this Basic Law does not otherwise prescribe or permit.

Article 70. (1) The states shall have the right to legislate insofar as this Basic Law does not confer legislative power on the Federation. (2) The division of responsibility between the Federation and the states shall be determined by the provisions of this Basic Law concerning exclusive and concurrent legislative powers.

regional importance.

The states and the federal government work together in the Planning Committee for the Construction of Higher Education Institutions. The Federal-State Commission for Educational Planning and the Advancement of Research was created for the purpose of nationwide educational planning. In 1973 this commission worked out a General Plan for Education, which established the framework for a coordinated development of the entire educational system of the states to 1985. The plan was approved by the heads of government of the Federation and the states.

The Basic Law guarantees freedom to live, travel, and choose an occupation anywhere in the Federal Republic. Thus the states have to cooperate not only with the federal government but also with each other in the areas in which federal regulations can take effect only after they have been applied at the state level. Working together ensures that the individual states coordinate their school systems and higher education systems with regard to structures, institutions, curriculums, and leaving certificates. The states work together for this purpose in the Standing Conference of Ministers of Education. This cooperative effort has led to comparability of the courses provided and the qualifications students acquire in education institutions.

The fundamental structures of the education systems of the various states – for example, the length of compulsory education, the beginning and end of the school year, length of vacation, designation of the various education institutions and their organizational form, essential elements of curriculums (e.g., succession of languages, and terminology used for the evaluation of school performance) – were standardized by the Agreements between the States for the Standardization of the School System in the years 1954 and 1964. On the basis of a simultaneous statement about appropriate standards, mutual recognition of examination results and certificates – and many other educational matters – were established. There will be further supplementary arrangements by the Conference of Ministers of Education.

In the field of higher education, the states came to an agreement on the standardization of the *Fachhochschule* system and on a variety of matters concerning tertiary-level institutions in general. Through the cooperation between the Conference of Ministers of Education and the West German Rectors Conference (the organization representing the institutions of higher learning through their rectors and presidents) a connecting link was established between governmental administration on the one hand and the autonomous administration of these institutions on the other. This cooperation has resulted, among other things, in agreements on the content and form of state and other academic examinations at institutions of higher learning (see sections 5.1.1 and 5.4).

1.3 Governance, Administration, and Supervision of the School and Higher Education Systems

1.3.1 Schools

The entire school system is under government supervision. As a rule, the schools are *state* or *municipal* institutions, but there are also *private schools*, which are subject to state supervision. Recognition of graduation certificates from private schools depends on their observance of pertinent state regulations about lessons, qualification of teachers, and examinations to be administered. State regulations for private schools take into consideration the particular educational concerns of such schools. There is, for example, a special arrangement for the *Waldorfschulen* (a group of private schools), which was agreed to by the Conference of Ministers of Education.

The Ministers of Education, as the highest educational authority in the individual states, are responsible for the administration of the school systems, which are generally composed of three levels: the Ministry of Education forms the top level, the district government the middle level, and the municipal and communal school administration the lower level. In some states and in the city-states the middle level is omitted. Teachers at state and municipal schools are civil servants of the individual states.

1.3.2 Institutions of Higher Learning

As a rule institutions of higher learning are *state institutions* with the status of a corporate body. They have the right of autonomous self-administration within the framework of the law. Their charters require approval by the appropriate state ministry.

In addition there are some institutions of higher learning for special purposes of the federal government (military and postal service), institutions of higher learning under church authority (which hold the status of a corporate body), and those under private control. These institutions of higher learning differ from the others because of their particular status and their generally limited autonomy.

The individual state institutions are administered cooperatively by their own generally "unified" administration and the appropriate state ministry. However, legal supervision (and to some extent supervision of certain matters of policy), responsibility for the establishment and ultimately also for the organization of the institutions, and control of finance and personnel all lie with the state ministry.

2. Description of the School System[1]

2.1 Allgemeinbildende Schulen (General Education Schools)

2.1.1 Grundschule

The elementary schools common to all children are called *Grundschulen*. They cover four years; in Berlin, Bremen, and Hamburg they cover six years (grades 1 through 4 or 1 through 6) unless grades 5 and 6 are conducted as an orientation level or the transition to the *Gymnasium* follows after grade 4, as in Hamburg. The functions and objectives of the elementary schools are determined by their place within the school system. Elementary schools provide children with the basic knowledge required for further education while attending as much as possible to the special abilities and interests of each individual child.

In addition to introductory reading and writing of the German language, subjects taught in the elementary schools include an introduction to social studies, history, geography, biology, physics, and chemistry, which become regular subjects of instruction later on. Mathematics, religious instruction (in Bremen, instruction in Bible history on general Christian principles), music, art, sewing, crafts, and physical education are taught as well. All of these are required subjects. Depending on their grade, children attend between 20 and 30 hours of class a week.

Teachers at elementary schools must have completed at least six semesters (in Bremen, eight semesters) at an institution of higher learning, followed by a preparatory service (practice teaching) which varies from one to three years. State examinations must be completed after the course of study and after the preparatory service (see also section 5.4.1.1).

1. See also Appendix 1.

2.1.2 Hauptschule

Hauptschulen are secondary schools extending from fifth through ninth grade; in the case of a six-year *Grundschule* or independent orientation level (as in Berlin, Bremen, and Hamburg) from seventh through ninth grade. Upon graduation, students as a rule enter employment while continuing to attend the *Berufsschule* (see section 2.2.1) until the completion of their vocational training or, at a minimum, for three years. Simultaneously the *Hauptschule* as a secondary school is closely connected with the vocational education school system through which one can also acquire higher-level certificates including the certificate of *Hochschulreife*.

Required subjects at the *Hauptschule* include German, foreign languages, mathematics, physics/chemistry, biology, geography, history, social studies, religious instruction, music, art, physical education (and, in Bavaria, education, domestic science, and economics). Mathematics and foreign language courses are taught at different levels of intensity to allow for the different learning abilities of students, to enable them to complete courses successfully and to facilitate transfer to other secondary institutions. Students attend between 30 and 33 hours of classes a week.

Teachers must have completed six semesters (in Bremen eight semesters) at an institution of higher learning followed by a preparatory service (practice teaching), which currently differs among the states and which takes from one to three years. State examinations must be completed after the course of study and after the preparatory service (see also sections 5.1.2 and 5.4.1.1).

2.1.3 Realschule

Realschulen are secondary schools that extend through the tenth grade. As a rule, they cover grades 5 through 10 or 7 through 10. In addition, there is a special program consisting of three grades (*dreiklassige Aufbauform*) for *Hauptschule* students who do not wish to transfer until after the seventh grade. In North Rhine–Westphalia four-grade special programs at the *Realschule* level are quite common. In Bavaria the regular *Realschulen* are also limited to four grades only.

Realschulen prepare their students primarily for nonprofessional careers and the demands of those careers in terms of independence, responsibility, and leadership. Their curriculums differ from those of the *Hauptschulen* in offering more language (two foreign languages, one of them required) and in teaching the subjects at a more advanced level. Students attend between 30 and 34 hours of classes a week.

Teachers at *Realschulen* must have completed at least six semesters

(in Bremen eight semesters) in two subjects at an institution of higher learning, followed by a preparatory service (practice teaching) of 18 months. State examinations must be completed after the course of study and after the preparatory service (see also section 5.4.1.1).

2.1.4 Gymnasium

The term *Gymnasium* covers all general-education secondary schools leading up to the thirteenth grade and offering a final examination *(Reifeprüfung/Abiturprüfung)*. Students who have passed the final examination have the qualification (*Hochschulreife*) to enter a university or other doctorate-granting institution. There are some *Gymnasien* whose graduation certificate (*allgemeine Hochschulreife*) entitles the student to take a course in any university discipline, and others (*fachgebundene Hochschulreife*) that qualify the student only for the study of specific subjects or groups of subjects. The traditional types of *Gymnasien* include the modern-language-oriented type *(neusprachliches Gymnasium)*, the mathematics/natural-science-oriented type *(mathematisch-naturwissenschaftliches Gymnasium)* and the classics-oriented type *(altsprachliches Gymnasium)*. In addition, there are other types emphasizing social sciences, economics, engineering and technical sciences, music, agriculture, home economics, and textile engineering. As a rule, *Gymnasien* extend from grades 5 through 13 or 7 through 13, depending on the structure of the preceding elementary school. In addition, there are special programs *(Aufbauformen)* to which *Hauptschule* students may transfer on completion of the seventh grade, as well as special programs for especially gifted *Realschule* graduates and graduates from vocational schools. On the basis of the resolution of the Conference of Ministers of Education of July 1972, the newly structured upper level of the *Gymnasium* was introduced in the school year 1976-77 (in Baden-Württemberg 1977-78) (see section 2.1.5). As part of adult education there are *Abendgymnasien* (evening classes) offering three-year programs in preparation for the *Abitur*, and institutions *(Kollegs)* preparing their students for entering various institutions of higher learning. The primary function of the *Gymnasien* is to prepare students for institutions of higher learning, i.e., to give them a basic education in academic subjects. In addition the *Gymnasien* serve as a preparation for demanding professional training outside the institutions of higher learning.

The *Gymnasien* that provide access to all institutions of higher learning teach German, mathematics, biology, geography, music, art, physical education, at least two foreign languages, history, social studies, physics, and chemistry as required subjects from grade 5 through grade 11. Religious instruction is a regular subject in most of the states. In grades 12 and 13 of all types of *Gymnasien*, German and mathematics are required

subjects. To this, the various types of *Gymnasien* each add two required subjects of their own, of which at least one must be a foreign language. Further requirements include physical education, one fine-arts-related subject, civics, and one subject from the area of natural science to be selected by the student. The reduction in the number of subjects starting in grade 12 is intended to permit greater concentration on individual subjects and a more thorough approach to them. Weekly hours of classes at the *Gymnasien* range from 30 to 36, with variations among the grades and from one state to another.

Teachers at the *Gymnasien* must have completed at least eight semesters at an institution of higher learning, followed by a preparatory service of at least 18 months. They must have completed state examinations at the end of their course of study and at the end of the preparatory service (see also section 5.4.1.1).

2.1.5 Newly Structured Upper Level of the Gymnasien

Following an agreement by the Standing Conference of Ministers of Education of July 1972, a new type of upper level is now gradually being introduced in the *Gymnasien*. This reorganization, the *Neugestaltete gymnasiale Oberstufe*, which entails administrative and curricular changes, serves several purposes: teaching is to be geared to the needs of the individual student even more than before, and the manner and substance of instruction is to be better adjusted to the requirements of the institutions of higher learning. At the same time, the reorganization of the entire upper secondary level *(Sekundarstufe II)* is to test the cooperation between general and vocational courses of education. Essential characteristics of the reorganized upper level are the replacement of successive grades by basic and intensified courses *(Grundkurse* and *Leistungskurse)*, new course offerings, including some that are career oriented, and the introduction of a credit-point system to evaluate student performance.

The upper level starts after the tenth grade. Students spend a minimum of two and a maximum of four years in the upper level; the years are divided into half-year segments. The program of instruction includes electives and required subjects. It includes language, literature, and art; social sciences; mathematics, natural science, and technology; religious instruction; and sports. Required subjects and electives are taught in 30 hours of classes a week, in a ratio of approximately two to one. For the most part, required subjects include German, foreign languages, the plastic and graphic arts, music, philosophy, general religious instruction, civics or history/geography/social studies, economics, mathematics, physics, chemistry, and biology. Electives may be the previously mentioned required subjects as well as education, psychology, sociology,

legal studies, geology, astronomy, technology, statistics, data processing, etc.

Both elective and required subjects are taught in basic and intensified courses. Basic courses are taught for two to three hours a week. Intensified courses have the purpose of providing the student with a thorough introduction to the various disciplines and to broaden his or her specialized knowledge with a view to its application in technology and in the arts. They take a minimum of five (usually six) class hours a week. Each student must select two intensified courses. Of these, one must be either a foreign language, or mathematics, or a natural science. The states are at liberty to prescribe a third intensified course.

2.1.6 Gesamtschule (Comprehensive School)

In the states of the Federal Republic there are at present over 200 experimental comprehensive schools in which a new type of lower secondary level *(Sekundarstufe I)* is being tested. The comprehensive schools convey the same educational material as the traditional schools from grades five through nine or ten. There are cooperative comprehensive schools in which schools of the traditional school system *(Hauptschule, Realschule,* and *Gymnasium)* continue to exist on the same premises; they are under joint administration, and their curriculums are harmonized to facilitate pupil transfer from one kind of school to another. There are also integrated comprehensive schools in which all pupils are taught together and the distinction between types of schools is waived. Instruction is in the form of subject-oriented courses taught at different levels and according to different models. Pupils graduate as they would in the traditional schools *(Hauptschule, Realschule,* promotion to grade 11 of *Gymnasium).* Some comprehensive schools also have an upper level that as a rule is identical to the upper level of the *Gymnasien.*

Teachers at the comprehensive schools must have the credentials that would be required for teaching at the traditional schools. At present, some states are in the process of reorganizing teacher training according to the goals of the 1973 General Plan for Education with a view to granting certification to teach at a level of education rather than at a particular kind of school as in the past. This change will meet the needs of the comprehensive schools.

2.2 Berufliche Schulen (Vocational Schools)

2.2.1 Berufsschule

Berufsschulen (part-time vocational schools) are part of the secondary school system. They are attended by students taking vocational training and by those who entered employment after leaving a *Hauptschule* or some other general-education school and are still of an age at which attendance at a *Berufsschule* is required. The purpose of these schools is to convey general and professional knowledge to the student with particular regard to the demands of vocational training.

In the framework of this vocational training, which is organized into general and professional stages, the general stage can be conducted as a basic vocational training year *(Berufsgrundbildungsjahr)* on a full-time basis or as cooperatively with on-the-job training. Approximately 40 percent of the classes taught are general-education classes, i.e. German, civics, economics, religious instruction, and physical education. The specialized courses taught at the *Berufsschulen* are tailored to the training requirements in the various fields of employment. Classes are taught on a part-time basis up to a total of 12 hours a week, or full time in segments spread out over the year. Graduates receive a certificate that is issued without a preceding examination; together with the examination certificate indicating the successful completion of their vocational training (*Facharbeiterbrief* or *Gesellenbrief* as the case may be) it enables them to enter schools offering advanced vocational training *(Fachschulen).*

The basic vocational training year (Berufsgrundbildungsjahr)
In accordance with a 1973 resolution of the Conference of Ministers of Education the first stage of vocational training is called *Berufsgrundbildungsjahr* (basic vocational training year), which can also be completed in one full-time academic year. It is designed to convey general knowledge and theorectical and practical knowledge in a specific vocational field. This course of study is a basis for subsequent, more specialized training. Admission to the basic vocational training year is open to young people who have fulfilled their full-time compulsory education requirements according to the applicable state laws. They must select a specific vocational field. Courses include those fields of study that are vocationally oriented in theory and practice, as well as more general fields. Successful completion of the basic vocational training year is counted as the first year of vocational training for the occupations that are associated with the respective vocational field.

The teaching at *Berufsschulen* and in the basic vocational training year

is carried out by teachers of general-education subjects and teachers of vocational theory. The former must have completed eight semesters at an institution of higher learning, followed by a period of practical training (as a rule one year) in their specialty and a preparatory service of two years. State examinations must be completed after the course of study and after the preparatory service (see section 5.4.1.1). Teachers of vocational theory must have completed initial training in a particular vocation, further training at an advanced training school *(Fachschule)* and basic educational theory training at special institutions.

2.2.2 Berufsfachschule

Berufsfachschulen (full-time vocational schools) prepare their students for a field of employment or provide vocational training, while at the same time improving the students' general knowledge. To be admitted, students must have successfully completed *Hauptschule* or *Realschule*, depending on the type of training they wish to obtain. The program at full-time vocational schools varies in length depending on the student's specialty and career objectives. However, it takes at least one academic year.

There are many schools providing programs of this type, including commercial schools *(Handelsschulen)*, schools teaching child care, and vocational schools that train assistants in the various technical fields. All *Berufsfachschulen* end with a final examination. In two-year *Berufsfachschulen*, where a *Hauptschule* leaving certificate is the prerequisite for admission, the acquisition of a certificate equivalent to that from a *Realschule* is usually possible. Hours of classes range from 30 to 35 a week. Teachers must have the same training as teachers at *Berufsschulen*.

2.2.3 Berufsaufbauschule

Berufsaufbauschulen are schools attended by students who are undergoing vocational training (or have completed such training, concurrent with or subsequent to, their enrollment in a *Berufsschule*). They teach general and vocation-oriented subjects at a more advanced level than the *Berufsschulen*. Students graduating from *Berufsaufbauschulen* have the equivalent of a *Realschule* education (enabling them to enter *Fachschulen*). The program consists of a minimum of 1,300 hours of classes. The *Berufsaufbauschule* as well as the *Berufsfachschule* offers several areas of specialization as follows: general commercial/industrial, industrial-technical, home economics–nursing, social work, and agriculture.

Subjects taught in the programs of all *Berufsaufbauschulen* include, in addition to the career-oriented subjects, German, one foreign language, history and civics; geography and economic geography; and mathemat-

ics, physics, and chemistry. Career-oriented subjects offered in all fields of specialization include economics and business management.

Teachers must have the same training as teachers qualified to teach at *Berufsschulen*.

2.2.4 Fachoberschule

These schools (grades 11 and 12) accept students who have completed *Realschule* or an equivalent program of instruction. They teach general education along with specialized theoretical and practical knowledge and skills; their certificates of graduation qualify students to enter *Fachhochschulen* (see section 5.1.5).

There are *Fachoberschulen* for engineering, business and management, home economics, social work, design, and navigation. Practical training is given in grade 11 (i.e. during the first year) four days a week throughout the year. In addition, students must attend a minimum of eight hours of classes a week. Class attendance in grade 11 is waived for students who have completed initial vocational training. In grade 12 (second year of the *Fachoberschule*) there are 30 hours of required classes a week in which general and career-oriented subjects are taught. Required subjects include German, social studies, mathematics, natural science, one foreign language, and physical education. The general subjects taught are the same for all areas of specialization. General subjects account for at least three-fifths of the required classes.

Teachers at *Fachoberschulen* must be qualified to teach at a *Gymnasium* or a vocational school, or they must have completed a course of study in natural science, technology, or economics followed by several years of work in their field of specialization.

2.2.5 Berufliches Gymnasium

The *berufliches Gymnasium*, which is based on a lower secondary level (*Sekundarabschluss I*) certificate (*Realschule* certificate or equivalent), has a vocational emphasis and prepares students for entering institutions of higher learning (general certificate of qualification). The fields of economics and technological sciences are offered in all states. A general ability to study is facilitated through a curriculum that differentiates between basic and intensified subjects. In addition some states offer other subjects and programs.

2.2.6 Fachschule

Fachschulen are schools that offer advanced vocational training as well as a general education. They train mid-level personnel to manage enter-

prises in their chosen fields (the trades, agriculture, domestic science), to train junior personnel, and to assume major responsibilities in specific areas.

In order to be admitted, students must have completed pertinent vocational training or they must have working experience in their field. As a rule, they must have been employed in their field before entry into a *Fachschule*.

Full-time programs at the *Fachschulen* generally take a maximum of one year. Some of the most important programs at the *Fachschulen* are listed below:

	Duration of program
Technikerschulen (schools for technicians)	4 half-year periods
Fachschulen für Wirtschaft (institutes of economics)	4 half-year periods
Fachschulen für Hauswirtschaft (domestic science schools)	2 or 4 half-year periods
Fachschulen für Sozialpädagogik (institutes of labor education)	4 half-year periods
Landwirtschaftsschulen (agricultural schools)	2 half-year periods
Höhere Landbauschulen (advanced institutes of agriculture)	2 half-year periods

Teachers must have the same training as teachers at *Berufsschulen*.

2.3 Sonderschulen (Special Schools)

Sonderschulen serve to develop and educate those children and young people who as a result of certain physical, mental, and emotional characteristics are unable to be educated in an ordinary school.

With the exception of the *Sonderschulen* for the mentally disabled and for those with learning disabilities, all *Sonderschulen* operate according to the curriculums for regular schools (*Grundschulen, Hauptschulen, Realschulen, Gymnasien*). However, the principles and teaching methods are adapted to the pupil's specific disability.

The forms of organization are varied according to local conditions and the type of disability. There are separate classes in regular schools (*Grundschulen* and *Hauptschulen*), half-day and full-day *Sonderschulen*, as well as boarding schools.

The teachers in the special schools must have completed eight semesters at an institution of higher learning, followed by a preparatory service of at least 18 months. State examinations must be completed after the course of study and after the preparatory service.

3. Vocational Training outside the Schools

3.1 General Information

Most 15-to-18-year-olds receive their vocational training following completion of their compulsory schooling (nine years) through a combination of on-the-job training and training in *Berufsschulen* (for details see the diagram in Appendix 2). The purpose of vocational training is to provide the basic skills for employment and, through career-oriented specialized training, the specialized skills and knowledge required for competence in an occupation.

While in accordance with the constitution of the Federal Republic the states are in charge of vocational training in the schools, the federal government is in charge of vocational training outside the schools, i.e. on-the-job training, etc.

Vocational training outside the schools (basic, continuing, and retraining) is governed by the Vocational Training Act of 1969, which provides comprehensive, uniform guidelines. The Act applies to vocational training programs in industrial and agricultural enterprises and to comparable nonindustrial programs, i.e. training programs for civil service employees and for members of the professions, as well as home training programs. In addition to the training programs given by the individual enterprises, there are vocational training centers sponsored by various organizations – for instance, employers' associations, chambers of trade or commerce, etc. The latter, as a rule, provide those aspects of training that cannot be provided to a sufficient extent by the enterprises themselves but are required under the regulations pertaining to vocational training.

3.2 Contracts for Vocational Training

Contracts for vocational training are concluded between the trainer (employer) and the trainee (formerly called apprentice) in accordance with the Vocational Training Act. The subject and length of vocational training

as well as the examination requirements are governed by regulations issued by the federal government (vocational training regulations). Vocational training takes from two to three years (usually three). In addition there are some three-and-a-half-year programs, for example in electrical engineering. At present there are more than 600 recognized occupations in which training may be given. For a list of occupations, see Appendix 3.

In accordance with a 1972 agreement between the federal government and the states, regulations for on-the-job training and general curriculums for vocational training in the schools are developed cooperatively between them. This ensures a close relation between on-the-job training and vocational training in the schools.

3.3 Places of Training and Training Personnel

The Vocational Training Act names the main criteria an enterprise must meet in order to qualify as a place of training. They specify the openings for which trainees can be accepted, the equipment that must be available for training, and the number of trainees that may be accommodated.

On-the-job training is provided by training personnel. A person must meet certain requirements to qualify as a trainer. As a rule, the person must have finished his or her own training, have pertinent work experience, and be at least 24 years old. In addition, a certain amount of theoretical knowledge connected with the employer-employee relationship and with vocational training are required. These requirements are specified in regulations on the qualifications of training personnel which have been issued for the various fields of employment in accordance with the Vocational Training Act.

3.4 Final Examinations

On completion of training for a recognized vocation, the trainee must take a final examination. For the trades, these examinations are administered by the Chambers for the Arts and Crafts; for the area of commerce and industry, by the Chamber of Commerce; for agricultural occupations, by the Ministry for Food and Agriculture in some of the states and by the Chambers of Agriculture in the others. The chambers mentioned above are self-regulatory bodies. They are public corporations, membership in which is mandatory for all commercial enterprises. Their functions are related to the group they represent, but they also perform functions on behalf of the government, as for instance in the area of vocational training.

The final examination is intended to show that the candidate has mastered the required skills, that he or she has the required theoretical and practical knowledge, and that the material essential to the vocational training that was taught in the *Berufsschule* has been mastered.

In accordance with the Vocational Training Act, at least one intermediate examination must be administered during the course of training to determine the trainee's level of proficiency. The examining board must include an equal number of representatives of the employers' association and the unions, as well as at least one teacher from a vocational school.

The examination consists of a portion involving a practical demonstration of skills, an oral portion, and a written portion. The candidate passes if he or she receives a mark of satisfactory or above in each portion of the examination (for further details on marks see section 4.1.1). The candidate is issued a certificate showing the results of the examination. The examination may be repeated twice.

Successful completion of vocational training is prerequisite to employment as a journeyman, helper, or skilled worker at the standard wage rate. It is also prerequisite for qualification as a master after several years of working experience and successful completion of the appropriate examination. Finally, it is prerequisite to admission to certain *Fachschulen* as well as to *Abendgymnasien* and *Kollegs* (see also sections 2.1.4 and 2.2.6).

3.5 Advanced Career-Oriented Training

Advanced training in a field of employment may be obtained through schools as well as in other ways. The pertinent schools *(Fachschulen)* accept applicants who have completed their training and who have work experience in their field, training them for higher positions. Those not wishing to go back to school may qualify for advanced positions by taking special examinations *(Fortbildungsprüfungen)* provided for by the Vocational Training Act.

These examinations, which may be administered by the agencies specified in the Vocational Training Act (for the area of trade and industry, these would be the Chambers of Commerce and the Chambers for the Arts and Crafts), must meet the special requirements applicable to vocational training for adults.

To ensure systematic and uniform advanced training that meets changing technical, economic, and social needs the federal government may issue regulations *(Fortbildungsordnungen)* about advanced career-oriented training, including examinations and other demonstrations of advanced skill, to supplement the Vocational Training Act.

3.6 Retraining for a Different Career

Vocational retraining serves to qualify a participant for an occupation or career distinct from that pursued in the original training. It differs from advanced vocational training, which is related to previous vocational training or practice, in that it permits the acquisition of totally new and different qualifications. In accordance with the Vocational Training Act any measures taken for vocational retraining must comply with the requirements of adult vocational training.

4.
Qualifications for Admission to Institutions of Higher Education

4.1 Allgemeine Hochschulreife (General Qualification)

The certificate of general qualification *(Zeugnis der allgemeinen Hochschulreife)* grants admission to all institutions of higher education.[1] The certificate of general qualification is customarily issued following the passing of a final examination at a *Gymnasium* after the completion of 13 grades. Details as to the nature of instruction in these schools and on their curriculums may be found in the preceding descriptions of the *Gymnasium*.

The final examination must be taken before an examining board under the chairmanship of an official of the school authority. It consists of a written portion, an oral portion, and in some subjects (physical education, music, art, and the natural sciences) a portion involving a practical demonstration of skills.

4.1.1 Final Examination in Traditional Gymnasien

Written examinations are in all cases required in German and mathematics. In language-oriented *Gymnasien* written examinations are also required in two foreign languages; in the remaining *Gymnasien* in one foreign language and in a subject directly related to the school's academic emphasis, such as physics, economics, music, and other subjects. The student may be required to take oral examination in the four subjects

1. In the case of art and music academies, additional proof of artistic talent in the chosen field is required as a rule (see section 5.1.3 and 5.1.4); in the *Fachhochschulen* (see section 5.1.5), practical training may be required.

of the written examination, in civics, or in a subject chosen by the student.

A student has passed the final examination if he or she has received a mark of "ausreichend" or above in all subjects. Special regulations permit students who receive marks below "ausreichend" in some subjects to pass the examination by receiving marks of at least "befriedigend" or "gut" in others. The Conference of Ministers of Education has issued the following definitions for marks:

1. *Sehr gut:* Performance clearly exceeds requirements.
2. *Gut:* Performance meets requirements in every respect.
3. *Befriedigend:* Performance meets general requirements.
4. *Ausreichend:* Performance shows some deficiencies but on the whole still meets requirements.
5. *Mangelhaft:* Performance does not meet requirements but shows sufficient basic knowledge to permit the student to overcome the deficiencies in the foreseeable future.
6. *Ungenügend:* Performance does not meet requirements, and even basic knowledge is so meager that the deficiencies cannot be overcome in the foreseeable future.

The certificate of general qualification states that the student has passed the examination and that the board of examiners has granted the certificate and thereby holds the student qualified for study at an institution of higher learning in the Federal Republic of Germany. It is signed by the chairman of the examining board and in some cases also by the members of the board and the school principal, and it is sealed with the seals of the school and the school authority *(Schulaufsichtsbehörde)*.

Final examinations and certificates of *Abendgymnasien* and *Kollegs* correspond closely to those of the *Gymnasien*. The agreements of the Conference of Ministers of Education regarding these two special institutions require, however, that their special circumstances and educational goals be given consideration in the final examination.

4.1.2 Final Examination in Gymnasien with Newly Structured Upper Levels

In the final examination *(Abiturprüfung)* at the completion of the newly structured upper level of instruction, students are examined in four subjects. They must show general knowledge in required subjects; in subjects in which they have taken intensified courses they must show that they acquired both deeper and broader knowledge. Written examinations must be taken in two subjects in which the student has taken intensified

courses and in an elective from the remaining required subjects (see section 2.1.5 above); students choose to take the oral examination in either an academic or artistic subject in which they have not taken a written examination.

For these students, the qualification for admission to study at institutions of higher learning is based on their achievement in both basic and intensified courses in grades 12 and 13 and on their achievement in the final examination. All these elements contribute equally to a grade-point total: of 900 possible points, the student must receive at least 300 (see Appendix 4 for details).

4.2 Fachgebundene Hochschulreife

The certificate *Fachgebundene Hochschulreife* qualifies students to study only specific subjects at any institution of higher education. It is generally granted on completion of grade 13 at a number of specialized *Gymnasien* in which the last three grades provide specialized vocational courses of study such as vocations for women, agriculture, and certain technical subjects. At this type of *Gymnasium*, vocational subjects are taught instead of a foreign language. This limited qualification can be changed into a general qualification through a supplemental examination in a foreign language.

In some states graduates of these schools receive a certificate of general qualification. These, however, are valid only in the state issued or in any other state that has an agreement of mutual recognition.

4.3 Fachhochschulreife

The certificate of *Fachhochschulreife* qualifies students for admission to *Fachhochschulen*. As a rule, it is issued following passing of final examinations after grade 12 at a *Fachoberschule* (grades 11 and 12).

The examination is both written and oral. The written examination is taken in four subjects, namely German, mathematics, a foreign language, and one subject taken from the particular subject area taught at the *Fachoberschule*. Oral examinations are required in all subjects of the written examination and one further career-oriented subject. To pass, a mark of "ausreichend" or above has to be achieved in all subjects.

In Baden-Württemberg and Schleswig-Holstein this qualification is acquired simultaneously with the certificate of promotion to grade 13 of the *technisches Gymnasium*.

4.4 Other Examinations for Admission

In all states there are examinations for admission to study at institutions of higher learning. These may be taken without proof of any specific prior schooling. However, applicants are required to furnish proof of general education, no matter how obtained, and of the capacity to pursue a specific course of study at colleges or universities. Often, the resulting certification is valid only in the state in which the examination was taken.

In addition to the various state regulations, the Conference of Ministers of Education in 1970 agreed on a process that enables applicants to obtain a certificate to study at any institution of higher learning even though they are not in possession of a certificate of qualification. This process is intended for those who have extraordinary capabilities in a specialized field but because of personal circumstances were unable to obtain such a certificate. Applicants should be at least 25 years old but not over 40. Applications must be made to the ministry of education of the state in which the studies are to be pursued. Applicants must name at least two persons able to testify to their capabilities, accomplishments, and education.

The examination consists of an oral and a written portion. The written examination consists of two papers written under supervision, one in the specialized subject to be studied and one testing general knowledge. The oral examination is in the form of a discussion, testing both the specific and general knowledge of the applicant. The examining board is made up of university faculty members, secondary school teachers, and a chairman appointed by the ministry of education.

Applicants who pass the examination receive a certificate which qualifies them for admission at any institution of higher learning in the Federal Republic of Germany.

4.5 Extension of Certain Qualifications for Admission to Higher Education

According to an agreement of the Conference of Ministers of Education, students who have achieved the *fachgebundene Hochschulreife* automatically qualify for general admission on conclusion of their specialized study program. Similarly, holders of the *Fachhochschulreife* automatically qualify for general admission on the conclusion of their course of study at the *Fachhochschule*. The *fachgebundene Hochschulreife* may also be transformed into *allgemeine Hochschulreife* by the passing of supplementary examinations.

4.6 Special Criteria for Admission to Higher Education in Oversubscribed Subjects (Numerus Clausus)

For a number of years the number of applicants for admission in an increasing number of subjects has exceeded the available spaces. This has made it necessary to introduce admissions restrictions. By means of the *Staatsvertrag über die Vergabe von Studienplätzen* (Inter-State Agreement on the Allocation of Study Places), now adapted to the Higher Education Act, the states of the Federal Republic regulate the allocation of spaces in subjects with admissions restrictions as follows.

Initially, up to 12 percent of all available spaces is reserved for hardship cases; up to 6 percent, for foreign students. An additional 7 percent is set aside for: students pursuing a second course of study, students preparing for occupations for which there is a special public need, and students transferring from *Fachhochschulen*. Most of the remaining admissions are apportioned on the basis of a list ranking applicants by achievement, i.e., on the basis of the grade average listed on their Certificate of Qualification. The remaining spaces are distributed according to the length of the waiting period calculated from the date of issue of the Certificate of Qualification, according to the seniority principle.

In those subjects in which the demand for admission is particularly strong (e.g., medicine, pharmacy, and dentistry) this system of limited admission has led to a demand for excessively high achievement in secondary schools and to excessively long waiting periods. As a result, the Higher Education Act authorized a special selection system which is currently being developed. This selection system provides – in addition to the quotas for hardship cases, foreigners, etc. – that admission be granted solely on the basis of a "Degree of Qualification," which is to be established on the basis of the Certificate of Qualification and certain subject-specific ability examinations (e.g., tests, practical demonstrations, and interviews).

4.7 The Evaluation of Foreign Admission Qualifications

Within the context of cultural exchange the authorities of the Federal Republic have always attached great importance to furthering study opportunities for foreign students. In the summer term of 1976, 47,209 foreign students were enrolled in West German institutions – and this despite the marked deficit of places available in many subjects.

Prospective foreign students must send their application for admission

to the institution at which they wish to study. In order to fulfill the admission requirements, the applicant must provide evidence that

- the marks obtained in previous education are such that the student is admissible to higher education in the home country.
- the knowledge acquired during previous education can lead to a fruitful pursuit of study at a German institution of higher education.
- the student has sufficient command of German.

Since there are no higher education entrance examinations in the Federal Republic and the right to be admitted is obtained by means of the *Abitur* (see section 4.1), foreign applicants are also admitted by the institutions of higher education mainly on the basis of their academic qualifications – that is to say, on the basis of an evaluation of their secondary school-leaving certificates issued in their home countries. Applicants from countries whose school-leaving certificates are basically considered to be of equivalent standard to those in the Federal Republic are directly admitted to study at the tertiary level.

Foreign applicants whose certification of previous academic achievement would have permitted them to study in Germany but who do not appear to have sufficient knowledge to be automatically admitted, must pass an examination before beginning studies in their chosen subject. To help such applicants prepare for the examination they are offered the opportunity of studying (usually for one year) at a so-called *Studienkolleg*.[2])

In subjects in which admissions are restricted, the admission of foreign applicants, as it is for German students, is governed by the "Inter-State Agreement on the Allocation of Study Places" of October 20, 1972, and the regulations issued on the basis of this Agreement. These provide for a distinction between the so-called oversubscribed *Numerus Clausus* subjects (medicine, dentistry, veterinary science, pharmacy, psychology), in which up to 6 percent of the available places may be allotted to foreign applicants, and the other *Numerus Clausus* subjects, in which up to 8 percent foreign students for each subject may be admitted.

In the subjects in which no admissions restrictions exist, there are no quotas for the admission of foreign students. In general it may be said that in these subjects foreign students account for 12 to 15 percent of the total. Quotas for students from particular countries are not prescribed, so

2. *Studienkollege* are institutions at which foreign applicants for admission to institutions of higher education whose certification of previous academic achievement does not fully correspond to a German Certificate of Qualification can fulfill the necessary requirements for pursuing a course of study in the Federal Republic. The course of instruction generally lasts one year and terminates in an examination designed to confirm that the applicant has the necessary qualifications for study (*Prüfung zur Feststellung der Hochschulreife*).

that the institutions themselves can decide freely on the admission of foreign students within the limits of the places available.

Neither German nor foreign applicants are required to pay tuition fees. As far as the financial prerequisites for admission are concerned, all that need be said is that foreign applicants are required to provide evidence that they are in a position to finance their stay in Germany. As study in Germany is essentially on a full-time basis, opportunities for work to support the student are very rare.

In general it should be emphasized that all foreigners who wish to study at an institution of higher education in Germany should first contact the institution of their choice in order to obtain full details on admissions requirements, study opportunities, and structure of courses. All institutions provide special counseling services (usually known as the *Akademisches Auslandsamt*) for foreign applicants and students.

5. Description of the System of Higher Education

5.1 Function of the Institutions of Higher Learning

The institutions of higher learning *(Universitäten Technische Hochschulen/Universitäten, Pädagogische Hochschulen, Musikhochschulen, Kunsthochschulen, Fachhochschulen, Gesamthochschulen)* foster and develop science and the arts through research, teaching, and study. They prepare their students for careers requiring the use of scientific knowledge and methods or the application of their artistic creativity and sensitivity. This includes educating new generations of scientists and artists and offering continued study (see section 5.4.4).

The free pursuit of these objectives is guaranteed by the constitution; they are defined in the Higher Education Act, applicable to all public institutions of higher learning. The Act was passed by the *Bundestag* (the lower house of parliament) with the consent of the *Bundesrat* (the upper house of parliament), and entered into force in January 1976. It provides for similar legislation to be passed by the states no later than 1979. The Act furthermore provides for a reorganization of the system of higher education with the aim of combining, through integration or cooperation, the various institutions of higher learning into comprehensive institutions of higher learning called *Gesamthochschulen* (section 5.1.6) or at least to ensure their cooperation. In the future distinctions between *Gesamthochschulen* will no longer be based on institutional criteria but on the courses of study that are offered. However, the following is a description of the various *present* types of higher educational institutions in terms of their specific function.

5.1.1 Universität

At the present time, there are 51 universities, technical universities *(Technische Hochschulen/Universitäten)*, and specialized institutions of university standing.[1] The universities offer courses of study in all fields of specialization, although as a rule technology-oriented subjects are not included. The latter are the main courses of study offered by the technical universities.

Upon completing the requirements in a course of study, students either take a state examination *(Staatsexamen)* or another academic examination *(Diplom, Magister, Promotion)*. State examinations are administered by state-appointed boards of examiners, which, as a rule, include university teachers. Under the law the institutions of higher learning are authorized to administer the other academic examinations themselves.

State examinations, based on state requirements formulated in the public interest, apply only to a relatively small number of professions: the medical profession (physicians, veterinarians, dentists), teachers, the legal profession, pharmacists, and food chemists. In their teacher training programs (for list of disciplines see Appendix 6), the universities formerly only trained teachers for the *Gymnasien* and *Realschulen* (in Hamburg also for *Volksschulen*). Now, as part of the reorganization of teacher training according to levels of education, courses of study for teachers for the primary level (i.e., for the *Grundschulen*, see section 2.1.1 above) and the lower secondary level (i.e., including *Hauptschulen* and *Realschulen*, see sections 2.1.2 and 2.1.3 above) must in some instances also be taken at the universities.

With regard to academic examinations that qualify students for access to other professions there is some differentiation. Initially examinations for a *Diplom* (certificate qualifying for entry into a specific profession) could only be taken in engineering and certain natural sciences; more recently economics and the social sciences were added to the list. Since about 1960, students in the humanities have been able to earn a *Magister Artium* in their speciality. The separation according to specialities is no longer uniformly maintained; hence, among the 69 currently existing courses of study leading to a *Diplom* (Appendix 7) and the 58 specialities leading to a *Magister* (Appendix 8) there are now 13 (Appendix 9) that offer a choice between the *Diplom* and the *Magister*.

The above explanations make clear that in some disciplines students may either take state examinations or academic examinations leading to

1. Including, for example, *Medizinische Hochschulen* but not *Fachhochschulen*. See Appendix 5 for list of universities and technical universities. Specialized institutions offering courses in theology and philosophy are listed separately in Appendix 5a.

a degree depending on their career goals. In this context it should be noted that it is also possible to take examinations in theology at universities and other doctorate-granting institutions.

Courses of study leading to state examinations, the examinations for the *Diplom* or the *Magister* may be continued to the *Promotion* (doctorate). Studies concluding in a doctorate, requirements for admission to such studies, and the programs for continued study are described in section 5.4.4.

The functions of the universities in the area of research include basic research, applied research, and the advancement of teaching and study. The right to engage in research and the right to administer examinations leading to a *Diplom*, a *Magister*, a doctorate, and to grant a certification for teaching at an institution of higher learning *(Habilitation)* are among the traditional basic rights of the universities and are guaranteed by law. Research at universities as against research at other institutions has special significance for the training of future generations of scholars and scientists.

5.1.2 Pädagogische Hochschule

Pädagogische Hochschulen (Appendix 10) are primarily concerned with training teachers for *Grundschulen* and *Hauptschulen* as well as for *Sonderschulen*. There is a distinction between the programs for *Grundschule* teachers and those for *Hauptschule* teachers. As a result of the reorganization of the school system, some of the states train teachers for a specific level of education, i.e., for the primary level (grades 1 through 4) and the lower secondary level *(Hauptschule, Realschule,* and grades 5 through 10 of the *Gymnasien)*. This training program concludes with a state examination.

In connection with their research functions in the areas of education and in subject-oriented teaching methodology, some of the *Pädagogische Hochschulen* have been authorized to award *Diplome* (in education) as well as the degrees of *Doktor der Philosophie* (Dr. phil.) and *Doktor der Erziehungswissenschaften* (Dr. paed.). In Bavaria the former *Pädagogische Hochschulen* have been incorporated as departments of education into the universities and other doctorate-granting institutions. In Bremen, Hamburg, and Hesse the universities themselves fulfill the function of the *Pädagogische Hochschulen*.

5.1.3 Kunsthochschule

Art academies *(Hochschulen/Akademien für bildende Künste)* (see Appendix 11) train their students for careers in the arts. In specialities such as architecture, sculpture, stage design, design, glass blowing and mold-

ing, goldsmithery and jeweling, graphic arts, commercial graphics, interior decoration, pottery, free and applied arts, painting and restoration, the course of study is completed in some cases by a final examination (state examination or institution-administered examination). Some art academies award the *Diplom* in architecture *(Diplom-Ingenieur)*, in design and experimental environmental design *(Diplom-Designer)*, and in graphic arts *(Diplom-Graphiker)*; others certify graduation (see also *Graduierung*, section 5.1.5 below) in design, architecture, and printing/engraving. Some art academies award the title of *Meisterschüler* to students who have completed 8 to 10 semesters and who have distinguished themselves in their field. Those art academies that have the requisite departments or programs (for instance, for arts and crafts education, educational science, and philosophy) also train art teachers for the *Gymnasien* and, to some extent, also for *Hauptschulen* and *Realschulen* (i.e., for the lower secondary level).

Aside from preparing students for careers in the arts, the art academies also engage in research and development of artistic modes and methods.

In contrast to the other types of higher education institutions, requirements for admission to the art and music academies (see below) differ from institution to institution; they vary in accordance with career objectives. Proof of artistic talent (admission test) is required for admission to all programs. The requirements in terms of prior schooling differ among academies and departments. The general trend is to make the Certificate of Qualification *(Hochschulreife)* a requirement for admission to all art academies. However, even in the future, applicants (with the exception of those wishing to become teachers and those following the course of study for the *Diplom*) will be admitted without the certificate if they have exceptional artistic talent and are able to show that their general education is sufficient for a course of study in their chosen field. The Baden-Württemberg law on art academies (including music academies) of February 1975 already states these admission requirements. At the academies in Bavaria and Lower Saxony students have a trial period of two semesters following admission. States not requiring a trial period do as a rule require an intermediate examination or some other proof of progress after two semesters.

5.1.4 Musikhochschule

Music academies (see Appendix 11) prepare their students for all artistic careers in music, including church music, and they also train teachers of music for the schools. Teachers of music for *Realschulen* and *Gymnasien* receive their training predominantly at these public institutions, which also do research in musicology as do the universities. Some music academies are academies for the performing arts as well, training students to

be actors, singers, or dancers (normally this is done by private institutions).

To be admitted to any of the programs, students must furnish proof of artistic talent through an admission test. As in the case of the art academies, requirements in terms of prior schooling vary in accordance with career objectives. In order to be admitted to the programs for music teachers and professional church musicians (both are completed by state examinations) or to obtain a *Diplom* in sound engineering students must have the Certificate of Qualification *(Hochschulreife)*.

Students planning to teach music at the *Gymnasien* and *Realschulen* must take a state examination after completing their studies; the music part of the examination is administered by an examining board for the arts, the examination in the second required subject by an academic examining board. In the same way, students planning to make church music their career must take a state examination *(A-Prüfung)*, while there are less demanding examinations *(Kirchliche B-Prüfung* and *C-Prüfung)* for other students of church music according to the career on which they intend to embark. In order to be certified as private teachers of music or to teach at music centers for the young or for adults *(Jugendmusikschulen, Volksmusikschulen)*, students must take the state examination for private teachers of music *(staatliche Privatmusiklehrerprüfung-PMP)* after a complete course of study in an artistic major and in music education. In some specialities, such as sound engineering, choir and orchestra direction, and direction of musical productions, students may take an examination leading to a *Diplom*. However, the majority of programs at the music academies (i.e., programs for composers, conductors, soloists, orchestra musicians, and choir singers) require internal final examinations which have different names at different institutions *(Künstlerische, berufliche Reifeprüfung, Reifeprüfung der Hochschule, Chorreifeprüfung*, etc.). The opera departments at the music academies also have their own internal final examinations. In addition, students may take the *Bühnenreifeprüfung*, an examination administered jointly by two professional organizations *(Genossenschaft Deutscher Bühnen-Angehöriger, Deutscher Bühnenverein)*, to determine whether they are ready to perform on stage.

5.1.5 Fachhochschule

Fachhochschulen (Appendix 12) were established in 1970-71 following a 1968 agreement among the states of the Federal Republic. The *Fachhochschulen* superseded the former *Ingenieurschulen* (engineering schools) and similar *höhere Fachschulen* (for instance, specialized schools for business, labor education, textiles and clothing). Their purpose is to prepare students for independent work in their specialities, through programs that convey scientific and artistic knowledge with a view to practical applicability. In their specific functions, *Fachhochschulen* may engage in

research and development projects.

Under this agreement among the states, *Fachhochschulen* must provide training in at least one recognized field of specialization. Courses of study are completed by a final state examination; a student who passes the examination is certified by the institution as having qualified in the speciality without additional study or examinations. To ensure uniform designations that are comparable for all institutions of higher learning, the Conference of Ministers of Education issued a list of 47 recognized specialities (Appendix 13) along with a list of titles to be conferred upon students who have successfully completed a course of study in these specialities (*Graduierungsbezeichnungen*, Appendix 14).

The specialities offered by the *Fachhochschulen* correspond in part to the ones offered by the universities and other institutions of higher learning, except that their programs are shorter and include longer periods of practical training. Consequently, the professional qualifications obtained at these institutions differ from those of the universities.

To be admitted, students must have the Certificate of *Fachhochschulreife* (meaning that they must have completed a *Fachoberschule*) as described in section 4.3 or some other certificate (for instance, the *Allgemeine Hochschulreife* or the *Fachgebundene Hochschulreife*), and as a rule they also must have taken some practical training.

5.1.6 Gesamthochschule

In accordance with the Higher Education Act of 1976 (see section 5.1 above), the institutions of higher learning described above are either to be transformed into comprehensive institutions or subjected to the direction of joint coordination committees to ensure cooperation among them.

The reorganization is intended to facilitate transfer from one institution to another and to provide possibilities for new courses of study. At the same time, cooperation among the various institutions is expected to have a beneficial effect in terms of cost effectiveness. The existing *Gesamthochschulen* are briefly described here, without a detailed description of the state experiments involving model programs and future plans for *Gesamthochschulen*.

Since 1970 a total of ten *Gesamthochschulen* have been established:

In Bavaria:	Gesamthochschule Bamberg	(1972)
	Kirchliche Gesamthochschule Eichstätt	(1972)
	Augustana-Hochschule der evangelisch-lutherischen Kirche in Bayern	(1972)

In Hesse:	Gesamthochschule Kassel	(1970)
In North Rhine–Westphalia:	Gesamthochschule Duisburg	(1972)
	Gesamthochschule Essen	(1972)
	Fernuniversität Hagen	(1975)
	Gesamthochschule Paderborn	(1972)
	Gesamthochschule Siegen	(1972)
	Gesamthochschule Wuppertal	(1972)

The *Gesamthochschulen* combine functions of the universities, the technical universities, the *Pädagogische Hochschulen, Fachhochschulen,* and to some extent also of the art academies. Students who meet their specific admission requirements may enroll in academic programs leading to a state examination (in the case of prospective teachers) or a university-administered examination *(Diplom, Promotion).*

Graduates of the *Fachoberschulen* and applicants who have an equivalent certificate of qualification may enroll in programs emphasizing practical training corresponding to those offered by the *Fachhochschulen,* which lead to state examinations and certification *(Graduierung)* in their chosen field.

In addition, some *Gesamthochschulen* (in Hesse and in North Rhine–Westphalia) offer integrated courses of study leading to the *Diplom.* In an integrated course of study, students with different certificates of qualification (Certificate of General Qualification, Certificate of *Fachhochschulreife*) jointly take an initial segment of study (*Grundstudium,* for four semesters in North Rhine–Westphalia, for two semesters in Hesse) where they are taught the fundamentals in their chosen field.

In North Rhine–Westphalia this program of basic courses is followed by an intermediate examination *(Zwischenprüfung)* which qualifies students to enter one of two advanced segments (*Hauptstudiengänge* I and II) offered in their field. The preliminary examination *(Diplom-Vorprüfung)* prerequisite to admission to level II of the program is equivalent to the preliminary examination that must be taken by university students studying for a *Diplom.* Therefore, students are able to continue their course of study at another institution of higher learning that has the right to confer doctorates. The advanced segment *(Hauptstudium)* may be completed after two or four semesters by taking a qualifying examination. The two-semester program (I) is primarily practice-oriented, while the four-semester program (II) emphasizes theoretical knowledge in the chosen field of specialization. Students holding Certificates of *Fachhochschulreife* are also admitted to the four-semester advanced program (II) provided they have successfully completed a number of supplemental courses *(Brückenkurse)* and have passed the pertinent intermediate examination (see Appendix 19).

In Hesse (*Gesamthochschule* Kassel) the two-semester program of the initial segment (*Grundstudium*) is at the same time a preparatory program that qualifies students to enroll in a six-semester advanced segment (*Hauptstudium*) without an intermediate examination. They have the option of earning a *Diplom*.

The *Gesamthochschulen* in Hesse and North Rhine–Westphalia currently offer the following integrated courses of study: architecture/urban and regional planning, chemistry, electrical engineering, mathematics, physics, safety engineering, social work, social sciences, engineering (design and manufacture in machine building and construction), and economic science.

In anticipation of the establishment of a *Gesamthochschule* some integrated courses of study (musical theater management, industrial engineering, ship building) are offered at various institutions of higher learning in Hamburg.

A student who has completed a course of study leading to the *Diplom* at a *Gesamthochschule* may continue on to study for the doctorate; in North Rhine–Westphalia students who have completed the shorter advanced program (I) must furnish proof of additional study toward the doctorate in order to be admitted to the doctoral examination. The same holds true in Hesse for students who have completed the integrated course of study at a *Gesamthochschule*.

5.2 Faculty at Institutions of Higher Learning

The responsibilities of faculty members at institutions of higher learning and the requirements for their appointment are specified by the Higher Education Act. All state regulations regarding faculty members that are not in accordance with the Higher Education Act must be changed to conform with the Act by 1979. According to the Act, academic and artistic staff employed at the institutions of higher learning will consist of the following (see descriptions below).

- *Professoren*
- *Hochschulassistenten*
- *wissenschaftliche Mitarbeiter and künstlerische Mitarbeiter*
- *Lehrkräfte für besondere Aufgaben*

A *Professor* has the principal responsibility of independent research and teaching. This includes teaching classes, administering examinations, counseling students, and active participation in the reform of study programs. Under the terms of the Higher Education Act, the minimum re-

quirements for the appointment of a professor are as follows.

- Completed course of study at an institution of higher learning.
- Suitability for teaching.
- Special qualification for scientific or artistic work (determined as a rule on the basis of the person's doctoral work).

Depending on the position, the following additional requirements may be applicable.

- Either additional academic achievements (which as a rule means *Habilitation*) or additional artistic achievements.
- Or special achievements in the application or development of scientific knowledge and methods over at least five years of work in the field.

Professors are appointed by the responsible minister of a state on the recommendation of the institution.

Hochschulassistenten are assigned to departments where they are given academic supervision by a professor selected by the department. Within a specified period they must complete the research and teaching requirements that are prerequisite to *Habilitation* (see section 5.1.1 above). It is also part of their duties to teach classes and to perform other academic tasks related to their speciality. However, they must be allowed a reasonable amount of time for their own research. Primary considerations in the hiring of assistants are the quality of their doctoral work or equivalent academic or professional achievements. In keeping with their academic functions and their position, *Hochschulassistenten* as a rule are working toward being appointed professors.

The *wissenschaftliche/künstlerische Mitarbeiter* (depending on the institution's specialization) perform academic services which include teaching subject-oriented courses and practical skills and teaching students to use scientific methods. As a rule, *wissenschaftliche Mitarbeiter* must have completed a course of study at an institution of higher learning.

Practical skills and knowledge (for instance in foreign languages) are taught by *Lehrkräfte für besondere Aufgaben*, who do not have to meet the requirements applicable to professors.

5.3 Organization of Courses of Study

A course of study is generally divided into *semesters*, which as a rule run from October until March and again from April until September. There are no classes during five months of the year. During these months, students review the material from past courses, prepare for and take examinations and, in some fields, complete the required practical work.

A full course of study at an institution of higher learning usually consists of an initial segment *(Grundstudium)* after which the student takes an intermediate or preliminary examination, followed by a second segment *(Fachstudium* or *Hauptstudium)* after which the student takes a final examination. As part of the reform of study programs, some institutions of higher learning have instituted joint basic segments that cover several related subjects, in order to avoid early specialization and rigid programs.

Under the terms of the Higher Education Act, the examination regulations for the individual programs now specify not only the academic requirements but also standards regarding the time a student is to spend in a program *(Regelstudienzeit)*. Provision must be made to ensure that the final examination can as a rule be taken by the end of the *Regelstudienzeit*. At the latest it is to be taken six months later. In the past, students had to complete a minimum number of semesters before being admitted to examinations.

The programs in the basic and advanced segments are supplemented by programs of continued studies (see section 5.4.4) designed primarily to educate future scholars and artists to work at the institutions of higher learning and at research facilities.

To be admitted, students must usually have completed the first degree examination in their field (state examination, *Diplom*, *Magister*). The programs themselves differ among the institutions of higher learning with regard to structure and requirements. The Higher Education Act lists the different types of programs under the general heading of *Aufbaustudium* (extended studies). Some of these programs are described in detail in the section on the structure and composition of courses of study (see section 5.4.4).

All institutions of higher learning offer the following types of courses: lectures, seminars, exercise courses, and study groups.

Lecture courses *(Vorlesungen)* generally consist of a presentation by a professor that is meant to provide students with a historical and systematic survey of their specialty or to introduce them to specific aspects of their field. To facilitate course selection by the student, course levels are indicated in the catalog; generally, there are no requirements for admission to these courses.

Supervised study takes the form of seminars *(Seminare)*, exercise

courses *(Übungen, Praktika)*, and study groups. In contrast to the lecture courses, seminars usually deal with limited topics to permit an exhaustive approach to individual research problems. Introductory seminars *(Proseminare)* must be taken during the early semesters. Their primary purpose is to teach students the use of research tools and methods in their field of specialization. Students may have to complete a number of introductory seminars before being admitted to an advanced seminar *(Hauptseminar)*. In cases where participation is numerically limited, an admission test may also be required. In a *Hauptseminar* the student is expected to work on a research problem independently and in a competent and comprehensive manner.

The evaluation of a student's achievement is carried out both for the student's own benefit and in order that the faculty members can gauge academic progress; evaluation procedures are specified in the regulations on the course of study and the examinations in a discipline. In accordance with the regulations on examinations, proof of academic progress based on an evaluation during the course of study may replace intermediate examinations in whole or in part and may reduce the requirements for final examinations.

Student performance in a required course may be evaluated on the basis of a written paper prepared by the student, an oral report in class, a colloquy, a specified number of analyses, etc., or a written examination lasting several hours *(Klausur)*. The results are made known to the student in a certificate issued for the respective course, such as a seminar *(Seminarschein)* and a laboratory class *(Laborschein)*.

5.4 Structure and Composition of Courses of Study

Most programs described in connection with the various types of institutions of higher learning are covered by general provisions or guidelines that were developed by the Conference of Ministers of Education in conjunction with the West German Rectors Conference beginning in 1968. These general guidelines are applicable to the following.

The state examinations prerequisite to teaching at the *Gymnasien* (1968).

The academic final examination *(Magister)* administered by faculties of the arts (1971).

Diplom-examinations (1975).

On the basis of the general provisions for *Diplom* examinations, the

Conference of Ministers of Education in 1972 also issued guidelines for examinations at *Fachhochschulen*.

5.4.1 Courses of Study Leading to the State Examination

The guidelines for examinations have been so generally accepted that they can serve as a basis for a description of the various courses. Where this is not the case, specific examples will be provided.

5.4.1.1 Training of teachers

Types of institutions and duration of programs

The courses of study that are required for teaching in the schools are offered by all institutions of higher learning described in section 5.1 except *Fachhochschulen*. Students planning to teach at the primary level and the lower secondary level (i.e., at *Grundschulen*, *Hauptschulen*, and *Realschulen*, not special schools) must complete a minimum of six semesters; those planning to teach at the upper secondary level (*Fochoberschulen*, *Gymnasien*, vocational schools), including special schools, must generally complete eight semesters.

Structure of programs

In accordance with state regulations on the training of teachers, students preparing for teaching careers must take courses in education and in their field of specialization, and they must also do a certain amount of practice teaching during academic vacations. The number of courses in education may vary, depending on the type of teaching and on the state.

As a rule, the student must study two subjects in addition to education. Depending on the subjects, an eight-semester program usually consists of two segments: an intermediate examination follows the first segment, and the first state examination for teachers follows the second.

Examination and grades

The examinations consist of oral (in Bavaria, also written) examinations in education, oral and written examinations in the chosen subjects, and, in the case of the first state examination, a major paper (*schriftliche Hausarbeit*) on a topic related to the preceding course of study, which must be completed within three or four months.

In 1971 the states agreed on the following marks for the examination certificates in all teacher training courses.

Final marks	*Marks for the subject*
"mit Auszeichnung bestanden"	"sehr gut"
"gut bestanden"	"gut"
"befriedigend bestanden"	"befriedigend"
"bestanden"	"ausreichend"
	"mangelhaft"
	"ungenügend"

To pass, a mark of "ausreichend" or above must be received in all subjects and for the major paper. (Regarding the system of grading, see section 5.4.2.1.)

Contents of programs
Appendix 15 lists selected courses of study for teaching careers at *Gymnasien, Realschulen, Hauptschulen, Grundschulen,* and vocational schools in mathematics, chemistry, physics, English, economics.

5.4.1.2 The study of medicine

Types of institutions and duration of programs
Medicine may be studied at the universities, technical universities, and at two medical schools in Hannover and Lübeck. The course of study requires a minimum of six years.

Structure of programs
According to the Regulations on the Certification of Physicians,[2] which provided for new guidelines for the study of medicine beginning in the summer of 1972, the program is divided into four parts whose minimum duration is as follows.

- Preclinical study followed by a preliminary examination *(ärztliche Vorprüfung)* (two years).
- First section of clinical study (one year) followed by the examination in medicine *(ärztliche Prüfung)*, part one.
- Second section of clinical study (two years) followed by the examination in medicine, part two.
- Third section of clinical study in the form of an internship at a hospital (one year), after which the student completes the examination in medicine, part three.

2. *Approbationsordnung für Ärzte* of October 28, 1970 (*Bundesgesetzblatt* [Federal Legislative Gazette] I, p. 1458) as amended on May 21, 1975 (*Bundesgesetzblatt* I, p. 1257).

Examinations and grades

After each section of the program students must take a written multiple-choice test. The third part of the examination in medicine includes an oral examination which precedes the written examination. Its purpose is to determine the student's basic methodological knowledge and skill in the treatment of patients.

The standardized tests used by all institutions of higher learning are developed by a central agency established by the states (*Institut für medizinische Prüfungsfragen*, Mainz). The tests are administered by local agencies designated by the state (*Landesprüfungsamt*). Students pass if they give correct answers to at least 50 percent of the questions.

Once students have been issued a certificate stating that they have passed part three of the examination in medicine, they may submit an application for certification as a physician to the chief health authority of the state. Once they have received the document of certification (*Approbationsurkunde*) they may practice the profession and use the professional title.

The contents of the program for the preclinical and the clinical sections are described in Appendix 16.

5.4.1.3 The study of law

Types of institutions and duration of programs

Law may be studied at the universities and at the technical university in Hannover. The course of study requires a minimum of seven semesters (for the two-part program described below).

Structure of programs

A general framework for the training of jurists in the Federal Republic is provided by the German Law on Judges,[3] which states the requirements for judicial office. Among other things, it specifies the minimum length of studies, the number of examinations to be taken, and two alternative program structures, the second of which was instituted in 1971.

Under the traditional (two-stage) program for the study of law, students study at a university for seven semesters and then take the first state examination (*Referendarexamen*) within approximately six months. This is followed by two years of preparatory service (*Referendardienst*) after which the student must complete the second state examination (*Assessorexamen*).

Following an amendment of the *Deutsches Richtergesetz* in 1971, single-stage programs offering study and practical training on an alternate basis were instituted for testing through 1981. The model programs take

3. *Deutsches Richtergesetz* as amended on April 19, 1972 (*Bundesgesetzblatt* I, p. 713) and on December 22, 1975 (*Bundesgesetzblatt* I, p. 3176).

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approximately six years and provide training equivalent to that of the two-stage programs. The programs that existed as of 1975 either require the evaluation of student performance throughout the course of study (in Bremen, Hamburg, Hannover) or an intermediate examination *(Zwischenprüfung)* (Augsburg, Bielefeld, Konstanz, Trier). They are completed by an examination *(Assessorexamen)* that is equivalent to the state examination.

The structure of the study of law differs among the states in accordance with their laws. However, most universities use the traditional two-stage program.

Examinations and grades

The first state examination to be taken by law students consists of an oral portion and a written portion. The written examination consists of proctored five-hour essays, one for each legal subject, to be written on separate days. In four of the states eight such proctored essays are required. Some states (Berlin, Hamburg, Hesse, Lower Saxony, North Rhine–Westphalia, and Schleswig-Holstein) also require a paper *(Hausarbeit)* to be written within four to six weeks, which reduces the number of proctored essays to three or four. Admission to the oral examination is determined by the results of the written portion. To be admitted to the oral examination, a student must receive a mark of "ausreichend" or above on the major paper. Oral examinations are conducted in groups; as a rule, each candidate is questioned for about one hour. The total average for the examination is based on the marks received in the written and oral portions.

Students who have passed the first state examination in law are issued a certificate showing their total average in terms of grades and grade points. The definitions for grades and grade points differ among the states, but they all use a total of seven categories.

Appendix 17 lists the traditional program (required subjects and electives) and the prerequisites for admission to the examinations.

5.4.2 Courses of Study Leading to Institution-Administered Academic Examinations[4]

5.4.2.1 Courses of study leading to the *Diplom*

Types of institutions and duration of programs

Courses of study leading to the *Diplom* are offered by universities, technical universities, *Gesamthochschulen*, art academies, music academies,

4. Less common examinations of institutions of higher learning (e.g. *Lizentiatenprüfungen* in law and theology) are not taken into consideration in this presentation.

and *Pädagogische Hochschulen;* at present these programs take a minimum of eight semesters.

Structure of programs

The programs are divided into two parts, followed by a preliminary examination and the *Diplom*-examination, respectively. Examinations may consist of several segments. As a rule, the preliminary examination must be taken after four semesters (at most, five) and the *Diplom*-examination after eight semesters.

Examinations and grades

Preliminary/intermediate examinations usually consist of proctored written examinations and other written work. These are followed by oral examinations, in which candidates are examined individually or in groups, with a minimum of 15 minutes allotted to each candidate and each subject.

The *Diplom*-examination (called *Diplom-Prüfung* or *Diplom-Hauptprüfung*) usually consists of a major paper (*Diplomarbeit*), proctored written examinations and other written work, and oral examinations. The major paper, which may be written before or after the oral examination, must be based on independent research using appropriate methods and must be completed within six months. The student fails the *Diplom*-examination if the major paper is given the mark of "nicht ausreichend."

As a rule, the following marks are used in grading the examinations.

Sehr gut (1)
Gut (2)
Befriedigend (3)
Ausreichend (4)
Nicht ausreichend (5)

Grade-point average from the various examinations determines the grade in the subject and the final grade.

Sehr gut	—	represents an average of 1.5 or less
Gut	—	represents an average in excess of 1.5 but not exceeding 2.5
Befriedigend	—	represents an average in excess of 2.5 but not exceeding 3.5
Ausreichend	—	represents an average in excess of 3.5 but not exceeding 4.0

Students usually pass the examination if they receive a mark of "aus-

reichend" (i.e., not exceeding 4.0) in all subjects related to their field of specialization. If a student does extremely well in the *Diplom*-examination, the *Diplom* certificate may read "mit Auszeichnung bestanden."

Students who pass the preliminary examination or the *Diplom*-examination are issued a certificate showing the marks they received. Once students have passed the *Diplom*-examination, they are awarded the degree by the institution, i.e., they receive a diploma and may henceforth include the designation "Diplom-" in their professional title (for instance, they may call themselves *Diplom-Psychologe* (psychologist), *Diplom-Ingenieur* (engineer), etc.). The *Diplom* is prerequisite to appointment to some senior-level civil service positions.

Contents of the programs

Appendix 18 describes selected courses in science, economics, social sciences, and engineering.

5.4.2.2 Integrated courses of study leading to the *Diplom*

Types of institutions and duration of programs

These programs are offered by *Gesamthochschulen* in North Rhine–Westphalia (six- or eight-semester programs) and in Hesse (eight-semester programs which include practical training). In Hamburg, integrated courses of study are offered jointly by the university, the *Hochschule für Musik und darstellende Kunst*, and/or the *Fachhochschule*. The duration of the programs varies depending on the course of study. It may be six or nine semesters for ship building and eight semesters for musical theater directors and industrial engineers. Experiments in model courses of integrated study at universities are not included here.

Structure of the programs

The programs currently offered by the *Gesamthochschulen* in North Rhine–Westphalia consist of basic segments and two types of advanced segments (*Hauptstudium* I and II). Students must either take successive examinations throughout the basic segments or an intermediate examination after the fourth semester. Students enrolled in the practical training advanced segment (*Hauptstudium* I) take the *Diplom*-examination after two further semesters of coursework, whereas those enrolled in the academic advanced segments (*Hauptstudium* II) take it after four further semesters.

In Hesse (*Gesamthochschule* Kassel) integrated courses of study consist of a two-semester basic segment (*Grundstudium*) also known as *Orientierungsphase* and a six-semester advanced segment (*Hauptstudium*) also called *Kernstudium* or *Schwerpunktstudium*, which includes one or two semesters of practice-oriented study depending on the pro-

gram. In order to move from one level to the next, students must show certificates indicating their performance in past courses (*Grundstudienzertifikat, Hauptstudienzertifikat* I and II).

In Hamburg a preliminary examination is taken after four semesters for the program for musical theater director and after five semesters for an industrial engineer. The course of study in ship building is composed of a four-semester basic segment and thereafter an advanced segment, including either two semesters of practical training courses or five semesters of academic courses.

Examinations and grades

At the *Gesamthochschulen* in North Rhine–Westphalia a preliminary/intermediate examination usually consists of several hours of written tests and/or oral examinations of at least 30 minutes on each subject. The intermediate examination is spread out over a prescribed period, which may be several weeks or semesters. The certificate issued for the intermediate examination indicates the marks received in the individual sections of the examination as well as the program (I or II) for which the student qualifies as a result of the examination.

The *Diplom*-examination or final examination is given in several parts consisting of written proctored examination and/or oral examinations (30 minutes for each subject). At the *Gesamthochschulen* in North Rhine–Westphalia the final examination following the eight-semester program (*Hauptprüfung* II) is more demanding in terms of the number of individual examinations and the requirements for the major paper (*Diplomarbeit*) than the one following the six-semester program (*Hauptprüfung* I). Hence, the requirements for the major paper (*Diplomarbeit*) in the two programs may differ with regard to the time allowed for completion and the topic of specialization. For instance, a major paper in physics would deal with technological applications in the case of *Hauptprüfung* I and with theoretical physics in the case of *Hauptprüfung* II.

The following marks are used in grading the individual examinations.

Sehr gut (1)
Gut (2)
Befriedigend (3)
Ausreichend (4)
Nicht ausreichend (5)

The final grade is computed by taking the average for the individual examinations; grades received for coursework prior to the examination (certificates) are also counted. If a student passes the examination, the final grade will be one of the following.

Sehr gut	represents an average of 1.5 or less
Gut	represents an average in excess of 1.5 but not exceeding 2.5
Befriedigend	represents an average in excess of 2.5 but not exceeding 3.5
Ausreichend/bestanden	represents an average in excess of 3.5 but not exceeding 4.3

Students pass the examination if they receive a mark of "ausreichend" or above in each of its parts. In the case of an outstanding performance in the *final* examination, a mark of "mit Auszeichnung bestanden" may be given in some disciplines.

Students who have passed the preliminary/intermediate examination and the final examination receive a certificate showing the above marks. The document issued for the final examination generally gives the title of the major paper, the final grade, and the grades received in the different parts of the examination and in the major paper. It states that the student was awarded the academic degree, indicating the standard length of the program (six or eight semesters). The academic degree, which is documented either on the certificate or on a separate diploma, differs in accordance with the program (*Hauptstudium* I or II) completed by the student: for instance, after the six-semester program, the student would be awarded the title of *Diplom-Ingenieurchemiker*, whereas after the eight-semester program his or her title would be *Diplom-Chemiker*.

Contents of programs

Appendix 19 lists examples of courses in physics, economics, architecture, and urban and regional planning.

5.4.2.3 Courses of study leading to the *Magister Artium*

Types of institutions and duration of programs

The *Magister* is awarded by universities, technical universities, and recognized *Kirchliche Hochschulen* (theological institutions) after a minimum of eight semesters of study. The *Magister der Theologie* may be earned at the *Hochschule für Philosophie* in Munich and at the *Kirchliche Hochschule* in Berlin. The disciplines in which the degree of *Magister Artium* (M.A.) may be earned are listed in Appendixes 8 and 9.

Structure of program

As a rule, one major and two minor subjects (or two subjects of equal weight) are required for the *Magister*. Subjects must be chosen from the combinations listed in the examination regulations. They should not be too closely related, but there should be some reasonable connection (for

instance, the Department of Languages at Hamburg University requires that students taking German philology as a major choose German literary history or the study of literature as one of their minors).

Examinations and grades

As a result of the program (see section 5.3 above) aimed at dividing all courses of study into segments with intermediate or preliminary examinations, some institutions of higher learning have already issued regulations regarding intermediate examinations for the *Magister* program. Intermediate examinations may consist of several successive examinations in the course of the program, or written and oral examinations in each subject following completion of the basic segment.

The final examination in the major subject usually consists of a major paper (*schriftliche Hausarbeit*), to be written within six months, and a proctored written examination. Oral examinations must be taken in the major subject and in the two minors, or in the two subjects of equal weight, as the case may be.

In grading the major paper and the examinations, the following marks are used.

Sehr gut (1)
Gut (2)
Befriedigend (3)
Ausreichend (4)
Nicht ausreichend (5)

If a mark of "nicht ausreichend" is received for the major paper, the student fails the entire examination. Students pass if they receive a mark of "ausreichend" or above in all subjects. The overall result of the examination is usually expressed in the following terms.

Mit Auszeichnung (if a mark of "sehr gut" has been received in all subjects)
Sehr gut
Gut
Befriedigend/bestanden
Nicht ausreichend/nicht bestanden

Candidates who have passed the *Magister* examination receive a document issued by the *Dekan* (Dean), which shows the subjects in which examinations were taken and the marks received. On receiving the document, the candidate may use the title *Magister Artium* (M.A.).

Contents of programs
Appendix 20 lists examples of courses in linguistics and English leading to *Magister* examinations.

5.4.3 Courses of Study at Fachhochschulen

Types of institutions and duration of programs
These courses of study are offered by *Fachhochschulen, Gesamthochschulen,* and, for specific disciplines, by some universities *(Technische Universität* München). Generally a course of study requires six semesters; in Baden-Württemberg and in Bavaria it is eight semesters (six semesters of study and two semesters of practical training).

Structure of programs
A course of study generally consists of two or three semesters in a basic segment and another three or four semesters in an advanced segment. The practical work required in Bavaria and Baden-Württemberg is counted as the third and the sixth of the eight semesters. In the majority of the states students must take a preliminary examination following the basic segment and a final examination on completion of the advanced segment.

Examinations and grades
The preliminary and final examinations consist of written and oral examinations in the required subjects and in electives to be chosen from specific subject areas in the basic and advanced segments. Also included are the grades received for seminars, practical courses, and colloquiums *(Kolloquien).*

For the final examination there is an additional requirement of a major paper, to be written by the student during the final stage of the course of study. It is intended to demonstrate the candidate's ability to apply scientific or artistic knowledge to independent and systematic research on a topic in the field of specialization. The time allowed for the major paper varies from one to two semesters.

Students pass the preliminary examinations if they receive a mark of "ausreichend" or above in all required subjects and in electives to be chosen from specific subject areas. In order to pass the final examination, students must also receive a mark of "ausreichend" or above on the major paper. Regarding the system of grading, see section 5.4.2.1.

Contents of programs
Appendix 21 lists examples of courses in engineering/electrical engineering, economics, and design/industrial design as offered at *Fachhochschulen.*

5.4

5.4.4 Continued Studies

Students wishing to pursue a subject further, normally after having completed a course of study, may take advantage of a number of programs that are currently being offered by institutions of higher learning. The programs, which are listed under the general term *Aufbaustudium* (see section 5.3) in the Higher Education Act, differ with respect to requirements and degrees. The following is an attempt to describe the various programs in terms of their objectives.

1. Studies toward the doctorate *(Promotion)* are designed to prepare students for doing independent scholarly work and for educating future scholars and scientists. In studies leading to the doctorate, the emphasis is on a student's work on a specific research topic and on presentation of the results in a dissertation. The requirements for doctorate study and for the doctorate examination are specified in the pertinent regulations of the institutions of higher learning.

2. The extensive specialized knowledge required for some professions may be obtained through continued study following completion of the *Hauptstudium*. In the areas of technology and natural science, especially, this degree of specialization is necessitated by constant new developments. Moreover, continued studies that go beyond the confines of the student's field of specialization may serve as preparation for specific professions. Institutions of higher learning are now offering programs for continued study in the fields of biomedicine, veterinary medicine, regional planning, nuclear technology, and operations research, to name just a few.

Types of institutions and duration of programs

Doctorates may be earned at universities, technical universities, some *Gesamthochschulen*, and *Pädagogische Hochschulen* that have the right to confer doctorates. Students seeking admission to a doctoral examination usually furnish proof of an eight- to ten-semester course of study in their field; they also must usually have been enrolled as regular students for two semesters at the institution concerned. Completion of the dissertation, which is the principal requirement for the doctorate, usually takes two to four years.

Structure of programs

German institutions of higher learning have few structural requirements regarding courses of study leading to the doctorate. The requirements for the doctorate are determined by the appropriate regulations issued by the faculties and departments of the institutions of higher learning. The regulations generally specify the admission requirements and the examination procedures for each subject area. Candidates must complete their

dissertation before applying for admission to the doctoral examination.

The dissertation topic may be selected by the candidate, or it may be chosen in consultation with the candidate's adviser; the latter may also suggest a topic. In the natural sciences and technology a dissertation may involve experiments in addition to theoretical research.

As a rule, knowledge of *Latin* is required for a doctorate in theology, the humanities, medicine, and law.

In most disciplines, candidates must have completed a course of study leading to a final examination before they are admitted to a doctoral examination. In the areas of natural science, engineering, economics, and the social sciences (see Appendixes 7 and 18) the *Diplom* is usually required for admission. In medicine, dental medicine, veterinary medicine, food chemistry, pharmacy, and law the first state examination is usually required.

In the disciplines of the faculties of arts that offer a *Magister* degree (see Appendix 8), admission to doctoral examinations is granted in most cases on the basis of 8 to 10 semesters of prior study; students must show evidence of successful completion of courses in their major subjects and submit course certificates for their minors. Faculties of arts often require a knowledge of Greek in addition to Latin for the doctorate.

Examinations and grades

Dissertations are reviewed by the examining board of the faculty or department. If a dissertation is accepted, the doctoral candidate must usually take an oral examination *(Examen rigorosum)* in the major and in two minor subjects.

The final grade of the doctoral examination is based on the dissertation grade and the grade received in the oral examination. Grade designations differ among institutions, but as a rule there are five categories. At the university of Konstanz, for instance, the final grade of a doctoral examination is one of the following.

Ausgezeichnet (summa cum laude) – 0
Sehr gut (magna cum laude) – 1
Gut (cum laude) – 2
Genügend (rite) – 3
Ungenügend – 4

Candidates fail the doctoral examination if they receive a final grade of "ungenügend."

Candidates who pass the examination are issued either a preliminary certificate *(Prüfungszeugnis)* by the institution or a *document* or *diploma* conferring the doctoral degree.

The institutions that issue a preliminary certificate after a successful examination have regulations pertaining to the doctorate that state that the diploma may be issued only after the doctoral candidate has submitted the required number of printed dissertation copies to the appropriate department. The distribution of the copies is the responsibility of the institution.

A representative list of the doctoral degrees conferred by institutions of higher learning is contained in Appendix 22.

Since programs for continued study not leading to the doctorate have been introduced at some institutions only, it is not yet possible to make any generalizations about them.

The Higher Education Act (see section 5.1), along with nearly all the higher education laws of the states, calls on institutions of higher learning to provide continuing education. Unlike the programs for continued studies *(Aufbaustudium)* described above, these activities are not part of the regular scheduled courses of study. Students enrolled for continuing education are to be given the opportunity to update the knowledge previously acquired. However, aside from a few beginnings at institutions of higher learning, continuing education of this type *(Kontaktstudium)* has not yet become a reality. The plans call for a gradual introduction of continuing studies through courses offered at the institutions and through correspondence courses (or a combination of the two).

Recommendations for the Evaluation of Certificates of Admission to Institutions of Higher Learning, of Course Work, and of Examinations

(Approved by the National Council on the Evaluation of Foreign Educational Credentials, July 27, 1977)

Introduction

- The recommendations are to be regarded as aids in the decision-making process by the appropriate officials in the *placement* of students or applicants. They do not, as a matter of principle, touch on the *method of admission*.
- They are concerned with the recognition of or credit for previous study and examinations for the purpose of a continuation of study and therefore do not have or imply any effect on the right to engage in a profession.
- Decisive in the evaluation is the proven scholarly achievement, not the citizenship, of the student.
- These recommendations extend only to those scholarly achievements which result from study at institutions recognized in the Federal Republic by the several Länder Ministries of Education.

I. Certificate of Qualification (Hochschulreife)

1. Generally, admission to American institutions of higher education shall be possible if a German certificate of qualification is presented. Such certificates may be a general certificate of qualification (allgemeine Hochschulreife), a certificate limited to specialized study (fachgebundene Hochschulreife) or a certificate for admission to Fachhochschulen (Fachhochschulreife).

2. Those with certificates limited to specialized study or to Fachhochschulen should normally be considered only for admission to similar specialized courses of study.

3. Holders of the certificate of qualification should receive one year's academic credit and may receive more at the judgment of the admitting institution.

II. Certificates of Completed Courses of Study and Examinations

1. Proof of completion of a total of at least four semesters of full-time study at universities or equivalent institutions of higher learning and proof of satisfactory passage of the preliminary-intermediate examination should enable the students to take specific graduate-level courses. Students should be considered for admission as special students at either the undergraduate or graduate level depending on the institutional policy, while the admitting institution determines what deficiencies are to be removed before full admission to a graduate degree program is granted. Admission to these courses may facilitate the applicants' assimilation into what is for them a different system of education. They should therefore be told that authorization to take graduate-level courses does not guarantee admission to graduate schools and/or graduate degree programs.

2. Those in possession of a certificate of completion of a course of study at Fachhochschulen should be able to enter advanced study in appropriate fields.

3. Those holding certificates of the completion of a university course of academic study – Diplomgrad, Staatsexamen, Magister Artium – should be admitted for graduate study with consideration of advanced standing credit. The amount of advanced standing credit depends on the individual applicant's achievements as well as the course of study of the American university in the subject under consideration.

The same applies to graduate programs leading to the Ph.D.

4. Individual student achievements in basic studies at universities or equivalent institutions and in studies at Fachhochschulen (practice certificates, seminar certificates, or laboratory certificates, e.g.) should be evaluated for credit transfer within the undergraduate program provided that the certificates indicate that the student completed the course successfully as a regular student. Lectures shall only be subject to similar evaluation if the institution certifies to regular attendance and if the applicant submits proof of the successful completion of a course-related test.

5. Point 4 should be applied *mutatis mutandis* for the recognition of items of achievement from Hauptstudien courses when a student applies for admission to graduate study.

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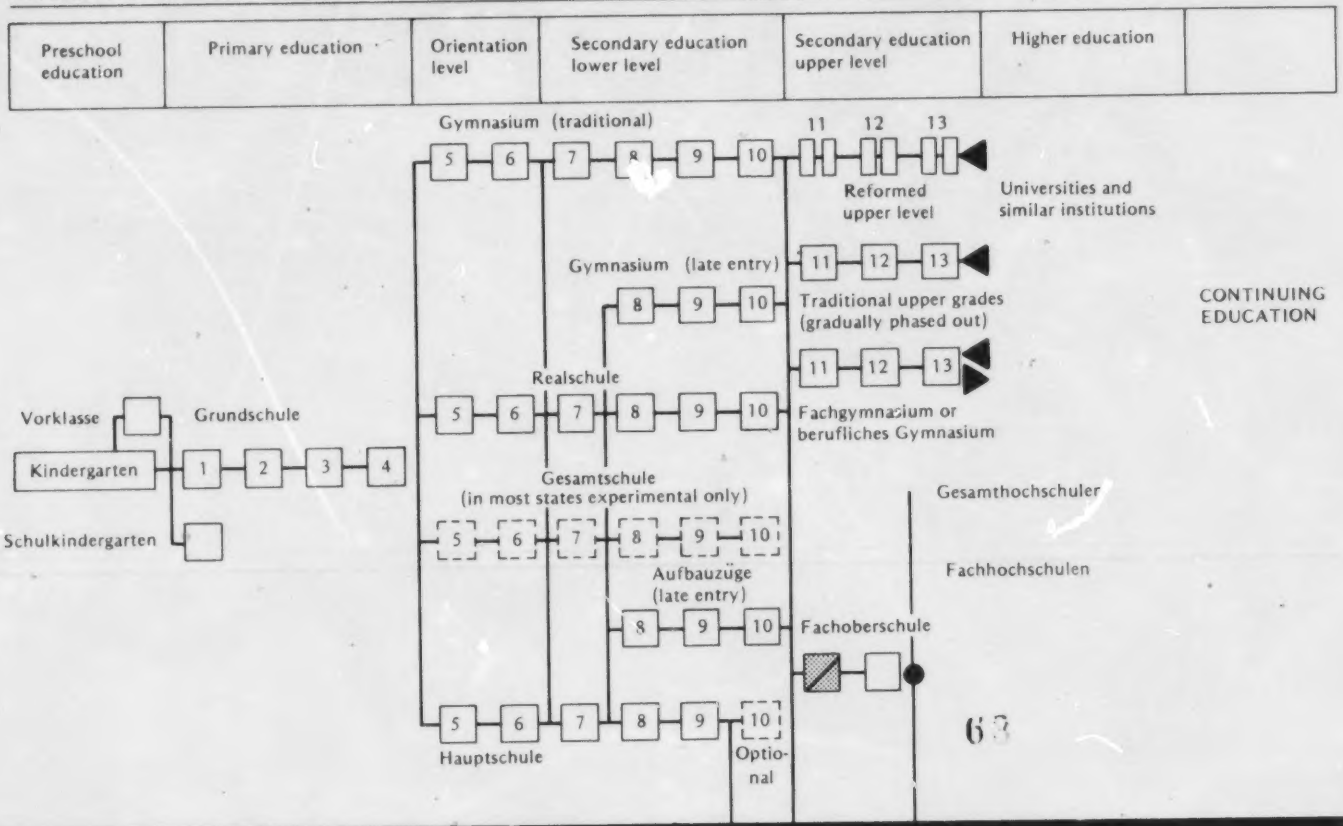
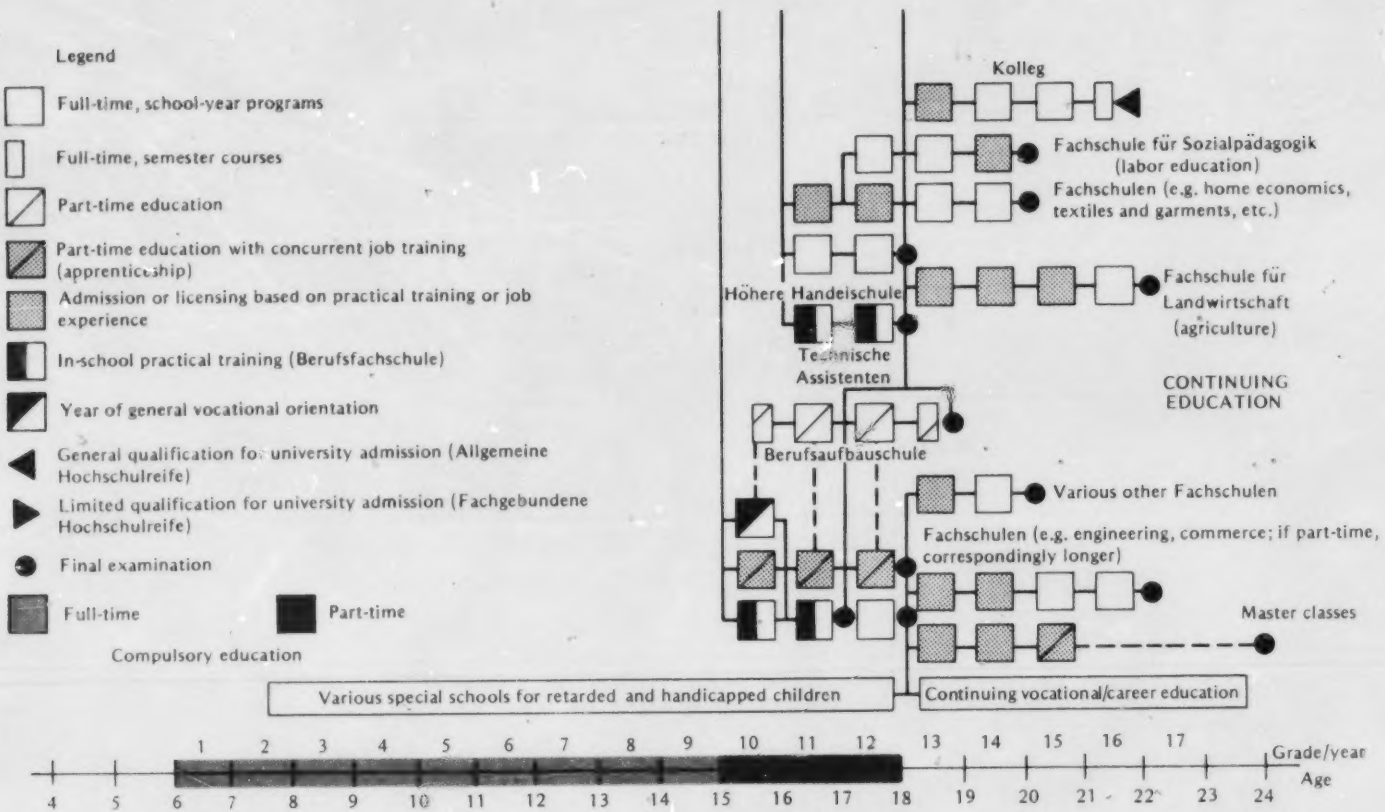
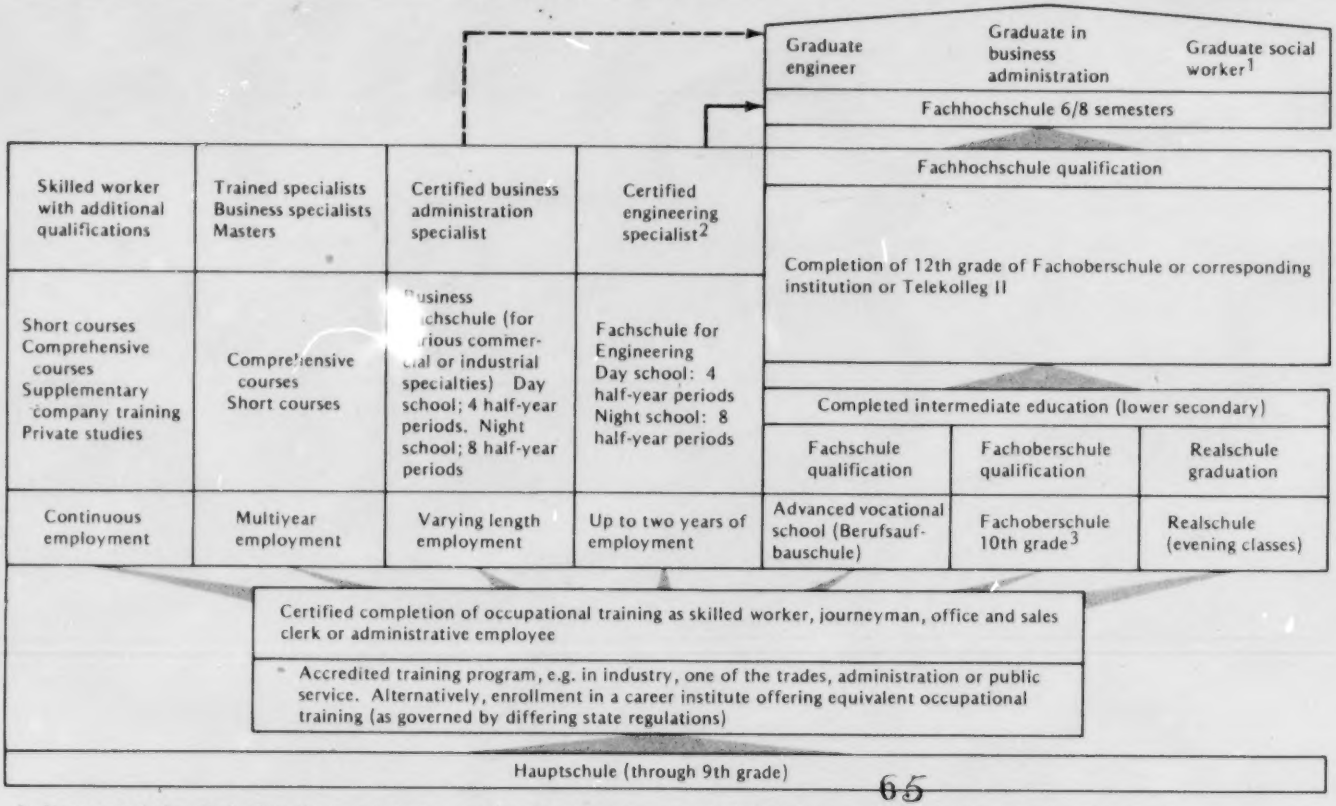
APPENDIX 1. Structure of the Educational System in the Federal Republic of Germany (as of 1976)




Legend
Full-time, school-year programs
Full-time, semester courses
Part-time education
Part-time education with concurrent job training (apprenticeship)
Admission or licensing based on practical training or job experience
In-school practical training (Berufsfachschule)
Year of general vocational orientation
General qualification for university admission (Allgemeine Hochschulreife)
Limited qualification for university admission (Fachgebundene Hochschulreife)
Final examination
Full-time
Part-time
Compulsory education
Kolleg
Fachschule für Sozialpädagogik (labor education)
Fachschulen (e.g. home economics, textiles and garments, etc.)
Höhere Handelschule
Fachschule für Landwirtschaft (agriculture)
Technische Assistenten
CONTINUING EDUCATION
Berufsaufbauschule
Various other Fachschulen
Fachschulen (e.g. engineering, commerce; if part-time, correspondingly longer)
Master classes
Various special schools for retarded and handicapped children
Continuing vocational/career education
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17
Grade/year
4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
Age

APPENDIX 2. Courses and Opportunities in Vocational Education and Training


Graduate engineer
Graduate in business administration
Graduate social worker[1]
Fachhochschule 6/8 semesters
Fachhochschule qualification
Completion of 12th grade of Fachoberschule or corresponding institution or Telekolleg II
Skilled worker with additional qualifications
Trained specialists Business specialists Masters
Certified business administration specialist
Certified engineering specialist[2]
Short courses Comprehensive courses Supplementary company training Private studies
Comprehensive courses Short courses
Business [illegible]chschule (for [illegible]rious commercial or industrial specialties) Day school; 4 half-year periods. Night school; 8 half-year periods
Fachschule for Engineering Day school: 4 half-year periods Night school: 8 half-year periods
Completed intermediate education (lower secondary)
Fachschule qualification
Fachoberschule qualification
Realschule graduation
Continuous employment
Multiyear employment
Varying length employment
Up to two years of employment
Advanced vocational school (Berufsaufbauschule)
Fachoberschule 10th grade[3]
Realschule (evening classes)
Certified completion of occupational training as skilled worker, journeyman, office and sales clerk or administrative employee
Accredited training program, e.g. in industry, one of the trades, administration or public service. Alternatively, enrollment in a career institute offering equivalent occupational training (as governed by differing state regulations)
Hauptschule (through 9th grade)

1. Upon completion of the first division of studies, possible transfer to the same field of study at a university (with limited qualification).
2. Some states admit certified engineering specialists to study at Fachhochschulen, subject to certain requirements.
3. Only in North Rhine-Westphalia.

9 years of Hauptschule, with leaving certificate
Berufsaufbauschule Realschule (evening classes)
Fachoberschule (one year less than normal secondary school)
Fachhochschule
University or similar institution
Berufsaufbauschule Realschule (evening classes)
(advanced) Berufsfachschule
Practical training
Fachhochschule
University or similar institution
Berufsaufbauschule Realschule (evening classes)
Job experience (not mandatory)
Gymnasium (evenings), Kolleg, institute leading to qualification for higher learning
Fachhochschule
University or similar institution
On-the-job training, including vocational school (for a number of accredited occupations on-the-job training is available even without the Hauptschule leaving certificate)
Job experience (not mandatory)
Gymnasium (evenings), Kolleg, institute leading to qualification for higher learning
Fachhochschule
University or similar institution
Job experience (not mandatory)
Gymnasium (evenings), Kolleg, institute leading to qualification for higher learning
University or similar institution

APPENDIX 3. List of Occupations for Which Accredited Vocational Training is Available[1]

Achatschleifer	agate cutter
Angestellter in der Bundesanstalt für Arbeit	staff employee, Federal Employment Agency
Angestellter in der Versorgungsverwaltung	staff employee, Public Support and Pension Administration
Anlagenführer/Chemie	operations manager, chemical plant
Apothekenhelfer	pharmacist's assistant
Appretur-Textilveredler (Stufenausbildung – 2. Stufe)	textile finisher, with advanced training
Arzthelferin	physician's assistant, female
Assistent an Bibliotheken	library assistant
Aufbereiter im Bergbau	processor, mining industry
Augenoptiker	optometrist
Ausbaufacharbeiter	interior installations specialist, construction industry
Ausbilder	instructor
– Gewerbliche Wirtschaft	– trades and industry
– Landwirtschaft	– agriculture
Ausbildungsmeister	master instructor
– Buchbinder	– bookbinder
– Buchdrucker	– book printer
– Druckindustrie	– printing industry
– Farbenlithograph	– color lithographer
– Flachdrucker	– flat-bed printer
– Graphisches Gewerbe (Schriftsetzer und Drucker)	– polygraphic industry typesetter and printer
– Kartograph	– cartographer
– Klischeeätzer und Nachschneider	– block engraver and cutter
– Nachschneider	– block cutter
– Offsetvervielfältiger	– offset-press operator
– Reproduktionsfotograf	– reproduction photographer
– Schriftlithograf	– letter lithographer
– Schriftsetzer	– typesetter
– Stereotypeur	– stereotyper
– Tiefdrucker	– rotogravure printer
– Verpackungsmittelmechaniker	– packaging technician
Automateneinrichter	machine setter
Backofenbauer	baking-oven maker
Bäcker	baker
Bandagist	orthopedic bandager
Bandweber	ribbon weaver
Bankfachwirt	trained banking specialist

1. Taken from: Die anerkannten Ausbildungsberufe, 1976 edition, by the Bundesminister für Bildung und Wissenschaft

APPENDIX 3. List of Occupations for Which Accredited Vocational Training is Available continued

Bankkaufmann	banker
Bauschlosser	locksmith
Baustoffprüfer	construction materials analyst
Bautechniker in der Wasserwirtschaftsverwaltung	construction engineer, water supply administration
Bauzeichner	construction draftsman
Beikoch	assistant cook
Bekleidungsfertiger	garment maker
Bekleidungsnäher	garment sewer
Bekleidungsschneider	garment cutter
Bekleidungsteilenäherin	garment sewer, accessories, female
Bergvermessungstechniker	assistant mining surveyor
Berufskraftfahrer	motor vehicle driver
Beschäftigungs- und Arbeitstherapeut(in)	occupational and work therapist
Beton- und Stahlbetonbauer	concrete and reinforced concrete worker
Betonstein- und Terrazzohersteller	cement stone and terrazzo maker
Betonwerker	cement stone maker
Betriebshelfer im Tischlerhandwerk	joiner's helper
Betriebspraktiker Metall	metalworker, institutional maintenance
Betriebsschlosser	salaried locksmith
Betriebswerker	maintenance man
Bilanzbuchhalter	accountant
Binnenschiffer	boatman, inland waterways
Biologielaborant	laboratory technician, biology
Biologiemodellmacher	model maker, biology
Blechschlosser	metalsmith
Blinder Stenotypist	blind stenotypist
Blinder Telefonist	blind telephone operator
Bodenleger	floor layer
Böttcher	cooper
Bohrer	drill operator
Bohrwerkdreher	horizontal boring machine operator
Bonbonmacher	candy maker
Bootsbauer	boatbuilder, wood
Borstpinselmacher	brush maker, bristles
Brauer und Mälzer	brewer and maltster
Brenner (landw.)	distiller, agriculture
Brillenoptikschleifer	lens grinder, eyeglasses
Brunnenbauer	well builder
Buchbinder	bookbinder
Buchdrucker; Schriftsetzer; Drucker	book printer; typesetter; printer

APPENDIX 3. List of Occupations for Which Accredited Vocational Training is Available continued

Buchhändler	bookseller
Büchsenmacher	gunsmith
Büglerin im Färber- und Chemischreinigerhandwerk	presser, dyeing and dry cleaning, female
Büroassistentin	office worker, female
Bürofachhelfer	office worker, male
Bürogehilfin	office clerk/administrative assistant, female
Bürohelfer	office clerk, male
Bürokaufmann	commercial clerk
Büromaschinenmechaniker	office-machine repairman
Büropraktiker	office helper
Bürsten- und Pinselmacher	general brushmaker
Bundesbahnaspirant	trainee, Federal Railways
Chemiebetriebsjungwerker	junior worker, chemical plant
Chemiefacharbeiter	skilled worker, chemical industry
Chemielaborant(in)	laboratory technician, chemical industry
Chemielaborjungwerker	junior worker, chemical laboratory
Chemigraf	process artist, lithography
Chirurgiemechaniker	surgical instrument maker
Dachdecker	roofer
Damenschneider(in)	tailor, ladies garments
Datenverarbeitungskaufmann	data processing salesman
Destillatbrenner	distillery worker
Destillateur	distiller, industrial
Diamantschleifer	diamond cutter
Diamantziehsteinmacher	diamond draw-die maker
Diatassistent(in)	dietary cook
Dolmetscher und/oder Übersetzer	interpreter and/or translator
Drahtwarenmacher	wire goods and screen maker
Drahtzieher	wireman
Drechsler (Elfenbeinschnitzer)	turner/ivory carver
Dreher (Eisen und Metall)	turner, iron and metals
Dreher	lathe operator
Dreher-Fachwerker	lathe operator, semi-skilled
Drogist	druggist
Drucker	printer
Druckerei-Textilveredler (Stufenausbildung – 2. Stufe)	printed cloth finisher, with advanced training
Druckfachwerker	printing worker
Druckformhersteller	form maker, book printing
Druckverarbeiter-Fachwerker	processing worker, printing industry
Druckvorlagenhersteller	draftsman, master printers

APPENDIX 3. List of Occupations for Which Accredited Vocational Training is Available continued

Edelmetallprüfer	precious metals analyst
Edelsteingraveur	precious stone cutter
Edelsteinschleifer	precious stone grinder
EDV-Fachwirt	EDP operations specialist
Einzelhandelskaufmann (gestufte Ausbildung – 2. Stufe)	retail merchant, with advanced training
Elektroanlageninstallateur	electrical systems installer
Elektrogerätemechaniker	electrical installer/appliance repairman
Elektrogerätezusammenbauer	electrical appliance assembler
Elektroinstallateur	electrical fitter
Elektroinstallationspraktiker/Fernmeldeinstallationspraktiker	semi-skilled fitter, electrical and communications systems
Elektromaschinenbauer	constructor, electrical machinery
Elektromaschinenmonteur	assembler, electrical machinery
Elektromaschinenwickler	wire winder, electrical machinery
Elektromechaniker	electrical engineer/electrician
Elektroniker	electronic specialist
Elektroniktechniker	electronic engineer
Emailschriftenmaler	enamel letterer
Energieanlagenelektroniker	electronic specialist, power plants
Energiegeräteelektroniker	electronic specialist, thermal equipment
Estrichleger	floor layer, plastered stone
Ewerführer	lighterman
Fachagrarwirt-Rechnungswesen	agricultural accountant
Fachkaufmann für Einkauf/Materialwirtschaft	business specialist/materials buyer
Fachkaufmann	business specialist
– Geschäfts- und Finanzbuchführung	– current accounting and equity
– innenbetriebliches Rechnungswesen	– intracorporation accounting
– Marketing	– marketing
Fachkaufmann im Radiohandel	business specialist, radio sales
Fachmeister	specialized master craftsman
– Barmeister	– master barkeeper
– Betriebsbraumeister	– salaried master brewer
– Küchenmeister	– master chef
– Rohrnetzmeister	– master plumber, pipe systems
– Sägewerksmeister	– sawmill master
– Serviermeister	– master server
Fachwerker	skilled worker
– Bergbau	– mining industry
– Metallbearbeitung und Montage	– metalworking and assembly
– Transport	– transportation

APPENDIX 3. List of Occupations for Which Accredited Vocational Training is Available continued

Fachwerker im Maler- und Lackierer-handwerk	skilled worker, painting and lacquering trade
Fachwirt für die Grundstücks- und Wohnungswirtschaft	trained specialist, real estate and housing
Färber und Chemischreiniger	drycleaner and dyer
Färberei-Textilveredler (Stufenausbildung – 2. Stufe)	textile finisher, dying plant, with advanced training
Fahrzeugpolsterer	vehicle upholsterer
Fahrzeugstellmacher	wheelwhright
Farbsteinschleifer, Achatschleifer und Schmuchsteingraveur	cutter and engraver, colored stones, agates, and precious stones
Faserspritzer	fiber worker
Federmacher	spring maker
Feinblechner	metalsmith, thin sheet metal
Feingeräteelektroniker	electronic specialist, precision instruments
Feinmechaniker	repairman, precision instruments
Feinoptiker	precision optical worker
Feinpolierer	fine grinder
Feinsattler	fancy saddlemaker
Feintäschner	fancy pursemaker
Fernmeldeelektroniker	electronic specialist, telecommunications
Fernmeldehandwerker	craftsman, telecommunications
Fernmeldeinstallateur	assembler, telecommunications
Fernmeldemechaniker	repairman, telecommunications
Fernsehinstandsetzer	repairman, television
Feuerungs- und Schornsteinbauer	fireplace and chimney builder
Figurenkeramformer	ceramic artist
Filmkopienfertiger	film copy maker
Fischwerker	fish preparer, food industry
Fischwirt	fisheries specialist
Flachglasveredler	flat glass processor
Flachgraveur	metal plate engraver
Fleischer	butcher
Flexograf	flexowriter
Fliesen-, Platten- und Mosaikleger	tile, plate and mosaic setter
Florist	florist
Floristmeister	master florist
Flugtriebwerkmechaniker	aircraft engine mechanic
Flugzeugmechaniker	aircraft mechanic
Flurbereinigungstechniker	land consolidation engineer
Former	molder
Formstecher	mold maker
Forstwirt	forester
Forstwirtschaftsmeister	master forester

APPENDIX 3. List of Occupations for Which Accredited Vocational Training is Available continued

Fotograf	photographer
Fotogravurzeichner	photoengraver
Fotolaborant(in)	photo-laboratory technician
Fotolaborant (Color)	photo-laboratory technician, color
Fräser	milling-machine operator
Fräser-Fachwerker	milling-machine operator, semi-skilled
Fremdsprachenkaufmann/fremdsprachlicher Korrespondent	multilingual business specialist, foreign sales/foreign correspondence
Friseur	hairdresser
Führungskräfte im graphischen Gewerbe	supervisors, graphic industry
Funkelektroniker	electronic specialist, radio communications
Gärtner	gardener
Galvaniseur	galvanizer
Galvaniseur und Metallschleifer	galvanizer and bench grinder
Galvanoplastiker	galvanizer/stereotyper
Gas- und Wasserinstallateur	plumber, gas and water connections
Gebäudereiniger	building cleaner
Gehilfe für Buchprüfung und Steuerberatung	assistant, auditing and tax consulting services
Gehilfe in landwirtschaftlichen Buchstellen	assistant, agricultural accounting
Gehilfe in wirtschafts- und steuerberatenden Berufen	assistant, business and tax consulting services
Geigenbauer	violin maker
Geprüfte Hauswirtschaftsgehilfin	certified helper for housekeeping and yardwork
Geprüfte Sekretärin/Geprüfter Sekretär	certified secretary
Geprüfter Schwimmeister	certified swimming instructor
Geratezusammensetzer	equipment assembler
Gerber	tanner
Geschäftsstenographen	commercial stenographers
Geschirrkeramformer	ceramic dishmaker
Gesundheitsaufseher	health inspector
Gewerbegehilfin im Bäckerhandwerk	shop assistant, baking trade, female
Gewerbegehilfe(in) im Färber- und Chemischreinigerhandwerk	shop assistant, dying and dry-cleaning trade
Gewerbegehilfin im Fleischerhandwerk	shop assistant, butcher, female
Gewerbegehilfin im Konditorhandwerk	shop assistant, confectionery trade, female

APPENDIX 3. List of Occupations for Which Accredited Vocational Training is Available continued

Gewerbekontrolleur	government inspector, trade and industry
Gießereiwerker	foundry worker
Gipsformengießer	ceramic form maker
Glasapparateblaer	glass blower, laboratory apparatus
Glasapparatejustierer (Wachsschreiber)	glass calibrator, laboratory apparatus
Glaser	glazier
Glasgraveur	glass engraver
Glasinstrumentenmacher	glass instrument maker
Glasmaler	glass painter
Glas- und Porzellanmaler	glass and porcelain painter
Glasschleifer und Glasätzer	glass cutter and engraver
Glaswerker	skilled glass worker
Gleisbauer	track layer
Glockengießer	church bell maker
Goldschmied	goldsmith
Gold-, Silber- und Aluminiumschläger	foilmaker, gold, silver, aluminum
Graveur	engraver
Gürtler	brazier
Gürtler und Metalldrücker	brazier and metal knob maker
Güteprüfer	quality inspector
Gummi- und Kunststoffauskleider	liner, rubber and plastic
Gummistrumpfstricker(in)	rubber stocking knitter
Hafenfacharbeiter	skilled dockworker
Hafenschiffer	harbor boat captain
Handelsfachpacker	packing specialist, shipping
Handelsfachwirt	trained specialist, retail/wholesale
Handschuhmacher	glove maker
Handzuginstrumentenmacher	hand-drawn instruments maker
Hauswirtschafterin	household manager, female
Hauswirtschaftsgehilfin	female helper, housekeeping and yardwork
Hauswirtschaftstechnischer Betriebshelfer	technical assistant, hotels and restaurants
Hauswirtschaftstechnischer Helfer	technical assistant, households
Hebamme	midwife
Heilerziehungshelfer	assistant, schools for the retarded and handicapped
Heilerziehungspfleger	nurse, schools for the retarded and handicapped
Helferin im Hotel- und Gaststättengewerbe	female helper, hotel and restaurant trade
Herrenschneider	tailor, men's clothing

APPENDIX 3. List of Occupations for Which Accredited Vocational Training is Available continued

Hobler	planer
Hochbaufacharbeiter	skilled worker, superstructures
Hochdruckrohrschlosser	pipe maker and fitter, pressurized systems
Hörgerateakustiker	acoustical specialist, hearing aids
Hohlglasfeinschleifer (Kugler)	hollow-ware glass buffer
Hohl- und Kelchglasmacher	hollow-ware glass blower
Holzbildhauer	wood sculptor
Holzblasinstrumentenmacher	wooden wind-instruments maker
Holzflugzeugbauer	maker of wooden airplanes
Holzmaschinenwerker	operator, woodworking machines
Hotel- und Gaststättengehilfin	housekeeping assistant, hotel and restaurant industry
Hüttenfacharbeiter	skilled worker, smelting industry
Hüttenwerker	foundry worker, smelting industry
Hut- und Mützenmacher	hatter and capmaker
Industriefachwirt	trained specialist, industrial operations
Industriekaufmann	business specialist, industrial production and sales
Industriemeister	industrial master,[2]
Fachrichtung	specialties:
– Allgemeiner Betrieb	– general industrial operations
– Allgemeiner Maschinenbau	– mechanical engineering
– Bekleidung	– plating and lining
– Bekleidungsindustrie	– clothing industry
– Chemie	– chemical industry
– Eisen-Hüttenwesen	– iron smelting
– Eisen- und metallverarbeitende Industrie	– iror and metalsprocessing industry
– Elektro	– general electrical engineering
– Elektrobetrieb	– electrical production plants
– Elektro-Energietechnik	– electric power generation
– Elektrotechnik	– electrical engineering
– Elektrotechnik-Energietechnik	– electrical and thermal engineering
– Elektrotechnik-Nachrichtentechnik	– electrical and communications engineering
– Energietechnik	– thermal engineering
– Feinmechanik und Optik	– precision instruments and optics
– Flachdruck	– flat-bed printing

2. Translator's Note: must have served apprenticeship, completed a minimum of five years job experience and must have taken four semesters of master courses in his specialty; chief duties are work supervision and training of new workers.

APPENDIX 3. List of Occupations for Which Accredited Vocational Training is Available continued

– Großbuchbinderei	– industrial bookbinding
– Gummi- und Kautschuktechnik	– natural and synthetic rubber engineering
– Gummi- und Kunststoffverarbeitung	– rubber and plastics processing
– Hochbau	– superstructure construction
– Hoch- und Tiefbau	– superstructure and substructure engineering
– Holzbearbeitung	– wood-working industry
– Holzverarbeitung	– wood-processing industry
– Hüttentechnik	– metallurgical engineering
– Keramik	– ceramics
– Kostenrechner	– cost engineering
– Lederherstellung	– leather production
– Maschinenbetrieb	– mechanized plant
– Maschinenbetrieb-Instandhaltung	– mechanized plant maintenance
– Maschinen- und Gerätebau	– production of machines and equipment
– Meß- und Regeltechnik	– measurements and control engineering
– Metall	– general metals engineering
– Metallbearbeitung	– metalworking industry
– Metallverarbeitung	– metal processing industry
– Nachrichtentechnik	– communications engineering
– Netzmeister im elektrischen Versorgungsbereich	– gridmaster, electric power grids
– Papierverarbeitung	– paper processing
– Papier- und pappeverarbeitende Industrie	– paper and cardboard processing industry
– Rohrleitungsbau (Fachgebiete: Gas-Wasser)	– pipe laying, gas and water
– Rohrnetzmeister	– master, utility pipe systems
– Schiffbau	– shipbuilding
– Schuhindustrie	– shoe industry
– Stahl- und Behälterbau	– steel products and steel containers
– Süßwaren	– candy and confectionery industry
– Textil	– general textile engineering
– Tiefbau	– substructure engineering, excavations and foundations
– Verpackungsmittelmechaniker	– packaging and container industry
– Wärme-Kälte-Isolierung	– hot and cold insulation
– Zement	– cement
Informatiker	specialist, computer and information science
Informationselektroniker	electronic display engineer
Isoliermonteur	insulator/assembler

APPENDIX 3. List of Occupations for Which Accredited Vocational Training is Available continued

Jäger (Berufsjäger)	professional hunter
Justizangestellter	staff employee, judicial administration
Juwelengoldschmied	jewelry goldsmith
Kabeljungwerker	junior cable worker
Kachelofen- und Luftheizungsbauer	maker of tile ovens and hot-air heating systems
Kanalbauer	canal excavation engineer
Karosseriebauer	vehicle body maker
Kartenschläger	jacquard plate maker
Kartograph	cartographer
Kassenangestellter in der Landeskassenverwaltung	staff employee, state banking administration
Kaufmann im Eisenbahn- und Straßenverkehr	business specialist, rail and road transportation
Kaufmann im Groß- und Außenhandel	business specialist, wholesale and foreign trade
Kaufmann in der Grundstücks- und Wohnungswirtschaft	business specialist, real estate and housing
Kaufmannsgehilfe im Hotel- und Gaststättengewerbe	office and sales clerk, hotel and restaurant trade
Kaufmann im Zeitungs- und Zeitschriftenverlag	business specialist, newspaper and magazine publishing
Kellner(in)	waiter/waitress
Keramiker	skilled ceramic worker
Kerammaler	porcelain painter
Kerammodelleur	ceramic model maker
Kessel- und Behälterbauer	boiler and container maker
Kinderkrankenschwester	children's nurse
Klavierbauer	piano maker
Klavier- und Cembalobauer	piano and harpsichord maker
Klebeabdichter	glue sealer
Klempner (Kühlerhersteller, Kühlerreparateur)	plumber, refrigeration assembly and repair
Klempner	plumber
Knappe (Erzbergbau)	skilled miner, ore mining
Knappe (Stein- und Pechkohlenbergbau)	skilled miner, anthracite and pitchblende
Koch (Köchin)	cook
Konditor	confectioner
Konfektmacher	candymaker
Korbmacher	basket weaver
Kostenrechner	cost engineer
Kraftfahrzeugelektriker	automobile electrician
Kraftfahrzeugmechaniker	automobile mechanic

APPENDIX 3. List of Occupations for Which Accredited Vocational Training is Available continued

Kraftfahrzeugschlosser (Instandsetzung)	automobile body shop mechanic
Kraftwerkmeister	master, power plant operations
Krankengymnast(in)	physical therapist
Krankenhaushelferin	female helper, hospital work
Krankenpflegehelfer(in)	practical nurse
Krankenschwester, Krankenpfleger, Kinderkrankenschwester	nurse/children's nurse
Krawatteninäherin	necktie seamstress
Küchenmeister	kitchen manager
Küchen- und Serviermeister	manager, kitchen and table service
Kürschner	furrier
Kulturbautechniker	soil and irrigation engineer
Kunststoff-Formgeber	plastics molder
Kunststoffschlosser	plastics engineer
Kupferschmied	coppersmith
Kurzschrift	stenographer
Kurzschrift, Maschinenschreiben	stenographer/typist
Kurzschrift, Maschinenschreiben, Phonotypie	stenographer/typist/phonotypist
Lackierer (Holz und Metall)	lacquerer, wood and metal
Lacklaborant	lacquer man
Lagerfachhelfer	skilled warehouse worker
Landmaschinenmechaniker	mechanic, agricultural machines
Landwirt	farmer
Landwirtschaftlich-technischer Laborant	laboratory technician, agricultural technology
Landwirtschaftlicher Laborant	laboratory technician, agricultural biology
Lehrmeister im graphischen Gewerbe	master instructor, graphic industry
Leuchtröhrenglasbläser	glass blower, lighting tubes
Lichtdruckretuscheur	retoucher, phototype printing
Litzenflechter(in)	cord weaver
Logopäde(in)	logopedic specialist
Luftverkehrskaufmann	business specialist, air transportation
Maler	painter
Malerhelfer	painter's helper
Maler und Lackierer	painter and lacquerer
Maler- und Lackierer-Fachwerker (Industrie)	industrial painter and varnisher
Management Assistent	management assistant
Maschinenbauer (Mühlenbauer)	millwright

APPENDIX 3. List of Occupations for Which Accredited Vocational Training is Available continued

Maschinenglasmacher	glass machine operator
Maschinenschlosser	mechanic and installer/machine fitter
Maschinenschreiben	typist
Maschinenschreiben/Kurzschrift	typist/stenographer
Maschinenstrickerin	knitting machine operator, female
Maschinenzusammensetzer	machine assembler
Masseur	masseur
Masseur und medizinischer Bademeister	masseur and water therapist
Mathematisch-technischer Assistent	assistant, engineering computations
Matrose	sailor
Maurer	bricklayer
Mechaniker	mechanic
Mechaniker (Nähmaschinen-, Zweirad- und Kältemechaniker)	mechanic, sewing machines, bicycles, refrigeration)
Mechanikerhelfer	mechanic's helper
Medizinisch-technische(r) Laboratoriumsassistent(in)	technical assistant, medical laboratory
Medizinisch-technische(r) Radiologieassistent(in)	technical assistant, medical radiology
Medizinischer Sektions- und Präparationsassistent	medical assistant, sections and preparations
Messerschmied	cutler
Meßtechniker	measurements engineer
Meß- und Regelmechaniker	technician, measurements and controls
Metallbearbeiter	skilled worker, metalworking industry
Metallblasinstrumentenmacher	musical brass instruments maker
Metallblasinstrumenten- und Schlagzeugmacher	maker of brass and percussion instruments
Metallfachwerker	skilled worker, metals industry
Metallflugzeugbauer	production worker, metal airplanes
Metallformer und Metallgießer	metal former and founder
Metallgewebemacher	metal screen maker
Metallschleifer	metal grinder/finisher
Metallwerker	metal worker
Metallwerker (Schlosser)	metal worker/machine fitter
Milchwirtschaftlicher Laborant	laboratory assistant, dairy industry
Modellbauer	model maker, wood
Modellschlosser	model maker, metal
Modelltischler	model maker/joiner
Modist(in)	tailor, women's fashions and accessories

APPENDIX 3. List of Occupations for Which Accredited Vocational Training is Available continued

Molkereifachmann	dairy supervisor, quality and processing
Müller	grain miller
Mützenmacher	cap and women's hat maker
Mützennäherin	milliner
Musikalienhändler	retailer, musical instruments
Musterzeichner und Patroneur	design draftsman and jacquard-plate maker
Musterzeichner für die Stickerei	patternmaker, embroidery
Musterzeichner(in) in der Stoffdruckerei	patternmaker, textile mill
Nachrichtengerätemechaniker	mechanic, communications equipment
Natursteinschleifer	marble and stone cutter
Notargehilfe	notary's assistant
Notariatsassistent	clerk, notary's office
Notenstecher	music engraver
Oberlederzuschneider	leather cutter, top-leather
Obst- und Gemüsekonservierer	canner, fruits and vegetables
Organisationsprogrammierer	programmer, organizational structures
Organisator	organizer
Orgelbauer	organ maker
Orgel- und Harmoniumbauer	organ and harmonium maker
Operateur-Chemische Technik	operator, chemical engineering
Orthopädienmechaniker	orthopedic mechanic
Orthopädieschuhmacher	orthopedic shoemaker
Orthoptist(in)	orthoptist
Papiermacher	paper maker
Papier-Druck-Werker	worker, printing and paper handling
Parkettleger	parquetry floor layer
Patentsanwaltsgehilfe	patent attorney's assistant
Pelzwerker	worker, fur industry
Personalfachkaufmann	business specialist, personnel management
Pferdewirt	horse expert
Pflanzenschutzlaborant	laboratory assistant, plant pathology
Pharmazeutisch-technische(r) Assistent(in)	technical assistant, pharmaceutics
Phonotypistin	phonotypist, female
Physiklaborant	laboratory assistant, physics
Planungstechniker	planning engineer

APPENDIX 3. List of Occupations for Which Accredited Vocational Training is Available continued

Plisseebrenner	pleat presser
Polsterer	upholsterer
Polster- und Dekorationshelfer	helper, upholstery and drapery
Polster- und Dekorationsnäherin	seamstress, upholstery and drapery
Postjungbote	junior letter carrier
Prägewalzengraveur	engraver, roll embossing
Praktischer Betriebswirt	business operations specialist
Programmierer	programmer
Radio- und Fernsehtechniker	technician, radio and television
Rauchwarenzurichter	fur skinner and tanner
Raumausstatter	interior decorator
Rechtsanwaltsgehilfe	lawyer's assistant
Rechtsbeistandsgehilfe	legal adviser's assistant
Reiseverkehrskaufmann	business specialist, travel and tourism
Reprograf	technician, reproduction graphics
Revolverdreher	turret lathe operator
Rohrinstallateur	pipe layer
Rohrleitungsbauer	pipe systems engineer
Rohrnetzbauer	utility pipe systems engineer
Rollanden- und Jalousiebauer	maker of Venetian blinds and louvers
Sägewerker	sawmill worker
Sattler	saddler
Schalenschmied (Kupferhammerschmied)	coppersmith, bowls and bottoms
Schaufenstergestalter	store window decorator
Scherenmonteur	scissors assembler
Schiffahrtskaufmann	business specialist, maritime commerce
Schiffbauer	shipfitter/hullmaker
Schiffszimmerer	carpenter, shipbuilding
Schilder- und Lichtreklame-hersteller	display and neon sign assembler
Schirmmacher	umbrella maker
Schirmnäherin	umbrella seamstress
Schleifer	grinder/polisher
Schleifer-Fachwerker	skilled worker, grinding/polishing
Schlosser (Blitzableiterbauer)	lightning-rod maker
Schlosser	mechanical engineer
Schlosser-Fachwerker	skilled worker, mechanical engineering
Schlosserwerker	semi-skilled worker, mechanical engineering

APPENDIX 3. List of Occupations for Which Accredited Vocational Training is Available continued

Schloß- und Schlüsselmacher	locksmith
Schmelzschweißer	fusion welder
Schmied	blacksmith
Schmucksteinfasser	gem setter
Schornsteinfeger	chimney sweep
Schriftgießer	type caster
Schriftsetzer	typesetter
Schuh- und Lederwarenstepperin	stitcher, shoes and leatherware, female
Schuhmacher	shoemaker
Schweißer	welder
Schweißwerker	welding worker
Schwimmeistergehilfe	assistant swimming master/pool manager
Seegüterkontrolleur	maritime cargo inspector
Segelmacher	sailmaker
Seiler	rope maker
Serviermeister	master server
Siebdrucker	serigrapher
Siebdruckfachwerker	skilled worker, serigraphy
Silberschmied	silversmith
Sozialmedizinische(r) Assistent (in)	assistant, social medicine
Sozialversicherungsfachangestellter	clerical specialist, social security administration
Sparkassenkaufmann	business specialist, savings banks
Speditionskaufmann	business specialist, shipping and forwarding
Sprachtherapeutischer Assistent für den außerklinischen Bereich	nonclinical speech therapist
Stahlbauschlosser	mechanical engineer, steel structures
Stahlformenbauer	mold maker, steel casting
Stahlgraveur	steel engraver/die maker
Stahlrollenstecher	steel-plate engraver, printing
Stahlstichprager	steel engraver/relief embosser
Steindrucker	lithographic printer
Steinmetz	stonemason
Steinmetz und Steinbildhauer	stonemason and sculptor
Stempelmacher	rubber-stamp maker
Stenotypist (blinder)	blind stenotypist
Stenotypistin	stenotypist, female
Stenosekretärin/Büroassistentin	stenographer-secretary, female
Stereotypeur	stereotyper
Stickerin in der Kleinmaschinen-stickerei	machine embroiderer
Sticker	embroiderer

APPENDIX 3. List of Occupations for Which Accredited Vocational Training is Available continued

Stoffprüfer (Chemie) (Glas-, Keramische Industrie sowie Steine und Erden)	materials analyst – chemical industry – glass and ceramics industry – stone and sand materials
Straßenbauer	skilled worker, road construction
Straßenbautechniker	road construction engineer
Straßenwärter	road maintenance worker
Stricker	knitter
Stukkateur	stucco plasterer
Süßmoster	cider maker
Systemmacher (Gewehr-)	breechmaker, firearms
Täschner	purse and luggage maker
Tankwart	filling station operator
Tapetendrucker	wallpaper printer
Tapisseristin	embroidery soft-goods designer, female
Taucher	diver/underwater mechanic
Tauchermeister	master diver/underwater engineer
Techniker	technician
– Kunststoffverarbeitung	– plastics industry
– Maschinenbau	– mechanical engineering
Technischer Betriebswirt	technical business administration specialist
Technischer Kaufmann (Holzwirtschaft)	sales engineer, timber industry
Technischer Zeichner	draftsman, engineering
Technische Zeichnerin	draftswoman, engineering
Technokeramformer	ceramics technologist, industrial products
Teilezurichter	parts fitter
Teilkoch	part-time cook
Teilzeichnerin	part-time draftswoman
Textillaborant (chemisch-technisch)	textile laboratory technician, chemical processes
Textillaborant (mechanisch-technologisch)	textile laboratory technician, mechanical processes
Textilmaschinenführer (Maschenindustrie)	textile machine operator, knitting
Textilmaschinenführer (Spinnerei)	textile machine operator, spinning
Textilmaschinenführer (Weberei)	textile machine operator, weaving
Textilmechaniker (Ketten- und Raschelwirkerei)	textile mechanic, double rib loom knitting

APPENDIX 3. List of Occupations for Which Accredited Vocational Training is Available continued

Textilmechaniker (Spinnerei)	textile mechanic, spinning
Textilmechaniker (Strickerei und Wirkerei)	textile mechanic, straight and jersey knitting
Textilmechaniker (Strumpf- und Feinstrumpfrundstrickerei)	textile mechanic, hosiery knitting, seam and round)
Textilmechaniker (Weberei)	textile mechanic, weaving
Textilveredler, Maschinenführung (Stufenausbildung – 1. Stufe)	textile finisher/machine operator, with basic training
Thermometerbläser	glass blower, thermometers
Thermometerjustierer (Thermometerschreiber)	thermometer adjuster/scale writer
Tiefbaufacharbeiter	skilled worker, substructures and excavations
Tierarzthelfer	veterinary assistant
Tierpfleger	animal keeper
Tierwirt	trained specialist, agricultural or industrial animals
Tischler	joiner
Trockenbaumonteur	drywall installer
Tuchstopferin	cloth mender, female
Übersetzer	translator
Übersetzer für Handelsfranzösisch	translator, commercial French
Uhrmacher	watchmaker
Universalfräser	universal milling machine setter/operator
Universalhärter	universal hardener
Universalhobler	universal planing machine setter/operator
Universalschleifer	universal grinding machine setter/operator
Vergolder	gilder
Verkäufer(in) (gestufte Ausbildung – 1. Stufe)	salesman/saleswoman, with basic training
Verkäuferin im Nahrungsmittelhandwerk	saleswoman, food trade
Verkaufshilfe	sales helper
Verkaufshilfe im Lebensmitteleinzelhandel	sales helper, food retailing
Vermessungstechniker	assistant surveyor
Verpackungsmitteltechniker	packaging engineer
Versicherungsfachwirt	trained insurance specialist
Versicherungskaufmann	business specialist, insurance

APPENDIX 3. List of Occupations for Which Accredited Vocational Training is Available continued

Verwaltungsangestellter der Handwerks-organisation/ Verwaltungsangestellter bei einer Industrie- und Handels-kammer	administrative employee, trade association or chamber of commerce
Verwaltungsangestellter im kirchlichen Dienst (E.-luth. Kirche)	staff employee, church administration, Lutheran Church
Verwaltungsangestellter in der Staatl. Innenverwaltung/Verwaltungsangestellter in der Kommunalverw.	administrative employee, federal, state or local government
Veterinärmedizinische(r)-technische(r) Assistent(in)	technical assistant, veterinary medicine
Veterinärmedizinischer Laborant	laboratory assistant, veterinary medicine
Vorpolierer(in) (Schmuck- und Kleingeräteherstellung	polisher/stain maker, jewelry and decorative implements
Vulkaniseur	vulcanizer
Wachszieher	candle maker
Wärme-, Kälte- und Schallschutz-isolierer	insulator, heat, cold and noise insulation
Wärmestellengehilfe	instrument observer and heating equipment tender
Wäscher und Plätter	washer and presser
Wäscheschneider	shirt maker
Wagner	cartwright
Walzendreher	roll lathe operator
Wasserbauwerker	skilled worker, water architecture
Wasserbauwerker (Meister)	master, water architecture
Weber	weaver
Weinhandelsküfer	cooper, wine sales
Weinküfer	cooper, wine industry
Werbefachwirt	trained advertising specialist
Werbekaufmann	advertising sales specialist
Werkgehilfin (Schmuckwarenindustrie, Taschen- und Armbanduhren)	production assistant —jewelry industry —pocket and wristwatches
Werkbahnbetriebsmeister	operations supervisor, company railroad
Werkschutz-Fachmann	plant security specialist
Werkschutzpersonal	plant security personnel
Werkstoffprüfer (Physik)	materials analyst, physics
Werkzeugmacher	toolmaker
Werkzeugmaschinenwerker	machine tool operator

APPENDIX 3. List of Occupations for Which Accredited Vocational Training is Available continued

Winzer	winegrower
Wirtschaftsassistent/Wirtschaftsfachwirt	industrial assistant/trained industrial specialist
Wirtschaftsassistent	industrial assistant
Wirtschaftsfachwirt	trained industrial specialist
Wirtschaftstechniker	technical industrial specialist
Wochenpflegerin	nurse, mother and infant care
Zahnarzthelferin	dental assistant, clerical
Zahnlargerist (Zahnlagerverwalter)	procurement and sales specialist, artificial teeth and dentures
Zahnmedizinische Fachhelferin	dental assistant, medical
Zahntechniker	dental prosthesis maker
Zeichner in der Wasserwirtschaftsverwaltung	draftsman, water supply administration
Zeltmacher	tentmaker
Zentralheizungs- und Lüftungsbauer	engineer, central heating and ventilation
Zimmerer	carpenter
Zinngießer	pewtersmith
Ziseleur	chaser
Zupfinstrumentenmacher	guitar maker
Zytologie-Assistent(in)	cytology assistant

APPENDIX 4. Evaluation of Performance and Overall Rating in the Final Examination (Abitur) in the Newly Structured Upper Level of the Gymnasium (reformierte gymnasiale Oberstufe)

Proof of general qualification for university studies allgemeine Hochschulreife is given by the performance of the student in the basic and intensified courses in grades 12 and 13 as well as by the performance in the final examination (Abiturprüfung). The evaluation of a term paper in an intensified course may be also taken into consideration.

Performance is first evaluated by the grading scale explained above in section 4.1.1 (ratings 1 through 6).

For compilation of the overall rating (Gesamtqualifikation) of the student the grades are transferred into grade points according to the following key:

grade 1 equals 15/14/13 points, by plus-minus differentiation
grade 2 equals 12/11/10 points, by plus-minus differentiation
grade 3 equals 9/8/7 points, by plus-minus differentiation
grade 4 equals 6/5/4 points, by plus-minus differentiation
grade 5 equals 3/2/1 points, by plus-minus differentiation
grade 6 equals 0 points

This key applies in absolute terms to the evaluation of *basic courses* (Grundkurse).

Since *intensified courses* (Leistungskurse) have, as a rule, 6 hours/periods per week (as compared to only 2 to 3 hours/periods for basic courses) and as they provide the student with a thorough introduction to the various disciplines and broaden his specialized knowledge, their evaluation is rated by a tripled number of points (e.g., grade 1 up to 45 points).

Performance in the four subjects during the final examination (Abiturprüfung) is rated by a quadrupled number of points (e.g., grade 1 up to 60 points). A term paper (Facharbeit) is rated by a doubled number of points (grade 1 up to 30 points).

The leaving certificate (Abiturzeugnis) contains the following ratings:

1. The evaluation of 20 basic courses taken in grades 12 and 13. The maximum number of points per course is 15, thus the maximum total is 300 points.
2. The evaluation of 6 intensified courses taken in grades 12 and 13 and possibly the evaluation of a term paper in an intensified course†. The possible maximum number of points is 45 per course, a total of 270. For the term paper a maximum of 30 points can be given, so that for intensified courses and term paper together again 300 points can be reached.
3. The ratings of the final examination in the subjects of the two intensified courses and of two basic courses as well as the performance ratings in these four subjects for the last semester. Per subject a maximum of 60 points can be reached in the final examination and 15 points for the performance during the last semester; this amounts to a possible total of 75 points per subject, and to a total of these four subjects of again 300 points.

† The term paper (Facharbeit) can also be substituted by special regulations, e.g., by higher rating of intensified courses.

APPENDIX 4. Evaluation of Performance and Overall Rating in the Final Examination (Abitur) in the Newly Structured Upper Level of the Gymnasium (reformierte gymnasiale Oberstufe) continued

The grand total of points reached in the three areas of evaluation – the maximum being 900 points – constitutes the overall rating (Gesamtqualifikation) of the graduate. In order to obtain the general qualification for university studies (allgemeine Hochschulreife) a minimum of 300 points is required.

In order to establish a class rank for admission to highly competitive disciplines (cf. section 4.6) the grand total of points is transformed into an average grade according to the following table:

Table for establishing the average grade for the Abitur Certificate

points	*average grade*	*points*	*average grade*	*points*	*average grade*	*points*	*average grade*
900-823	1,0	660-643	2,0	480-463	3,0	300	4,0
822-805	1,1	642-625	2,1	462-445	3,1		
804-787	1,2	624-607	2,2	444-427	3,2		
786-769	1,3	606-589	2,3	426-409	3,3		
768-751	1,4	588-571	2,4	408-391	3,4		
760-733	1,5	570-553	2,5	390-373	3,5		
732-715	1,6	552-535	2,6	372-355	3,6		
714-697	1,7	534-517	2,7	354-337	3,7		
696-679	1,8	516-499	2,8	336-319	3,8		
678-661	1,9	498-481	2,9	318-301	3,9		

The table is based on the following formula:

$$P \longrightarrow N \cdot (P) = 1, \text{ if } P > 840$$

$$\frac{1}{10} \cdot \left[\frac{1020\text{-}P}{18}\right], \text{ if } 300 \leq P \leq 840$$

Note: [. .] means the (Gauss) bell curve function

APPENDIX 5. Universities, Technical Universities and Specialized Institutions of University Standing

(As of July 1977)

Technische Hochschule	Aachen
Universität	Augsburg
Universität	Bayreuth
Freie Universität	Berlin
Technische Universität	Berlin
Universität	Bielefeld
Universität	Bochum
Universität	Bonn
Technische Universität	Braunschweig
Universität	Bremen
Technische Universität	Clausthal
Sporthochschule	Cologne
Universität	Cologne
Universität	Constance
Technische Hochschule	Darmstadt
Universität	Dortmund
Universität	Düsseldorf
Universität	Erlangen-Nuremberg
Universität	Frankfurt
Universität	Freiburg
Universität	Giessen
Universität	Göttingen
Universität	Hamburg
Hochschule der Bundeswehr	Hamburg
Medizinische Hochschule	Hanover
Tierarztliche Hochschule	Hanover
Technische Universität	Hanover
Universität	Heidelberg
Universität	Hohenheim
Universität	Kaiserslautern
Universität	Karlsruhe
Universität	Kiel
Medizinische Hochschule	Lübeck
Universität	Mainz
Universität	Mannheim
Universität	Marburg
Hochschule der Bundeswehr	Munich
Technische Universität	Munich
Universität	Munich
Universität	Münster
Universität	Oldenburg
Universität	Osnabrück
Universität	Passau
Universität	Regensburg

APPENDIX 5. Universities, Technical Universities and Specialized Institutions of University Standing continued

Universität	Saarbrücken
Hochschule für Verwaltungswissenschaften	Speyer
Universität	Stuttgart
Universität	Trier
Universität	Tübingen
Universität	Ulm
Universität	Würzburg

Schools of Philosophy and Theology

Philosophisch-Theologische Hochschule der Salesianer Don Boscos	Benediktbeuren
Philosophisch-Theologische Hochschule	Fulda
Philosophisch-Theologische Hochschule	Königstein/Taunus
Hochschule für Philosophie	Munich
Theologische Fakultät (Academia Theodoriana)	Paderborn
Philosophisch-Theologische Hochschule	Passau
Theologische Fakultät Trier	Trier
Philosophisch-Theologische Hochschule	St. Georgen/Frankfurt

Religious Institutions of Higher Learning

Kirchliche Hochschule	Berlin
Kirchliche Hochschule	Bethel
Augustana-Hochschule der evangelisch-lutherischen Kirche in Bayern	Neuendettelsau
Lutherische Theologische Hochschule	Oberursel/Taunus
Kirchliche Hochschule	Wuppertal

APPENDIX 6. Disciplines for Teaching Careers at Gymnasien, Realschulen, and Vocational Schools and for Teaching Careers at the Lower and Upper Level of Secondary Schools

(as of July 1977)	
Agrarwissenschaft	agricultural sciences
Anglistik/Englisch	Anglistics/English
Arbeitslehre	job orientation and counseling
Architektur	architecture
Bauingenieurwesen	civil engineering
Betriebswirtschaftslehre	business administration
Biologie	biology
Biotechnik	bioengineering
Chemie	chemistry
Chemieingenieurwesen/ Verfahrenstechnik/ Chemietechnik	chemical engineering
Elektrotechnik	electrical engineering
Geographie	geography
Germanistik	Germanics
Geschichte	history
Gestaltungstechnik	design technology
Haushalts- und Ernährungswissenschaft	home economics and nutrition
Hauswirtschaft und Werken	domestic management and practical work
Heilpädagogik	education of the retarded and handicapped
Informatik	computer and information sciences
Klassische Philologie	classical philology
Kunstgeschichte/Kunstwissenschaft	art history/fine arts
Kunsterziehung/Künstlerisches Werken	art instruction/applied arts
Lebensmittelchemie	food chemistry
Allgemeine/Vergleichende Literaturwissenschaft	general/comparative literature
Maschinenbau	mechanical engineering
Mathematik	mathematics
Metalltechnik	metals technology
Musikerziehung/Musikwissenschaft	musical instruction/musicology
Pädagogik	education
Philosophie	philosophy
Physik	physics
Politologie	political science
Psychologie	psychology
Romanistik	Romance studies
Slawistik	Slavic studies
Sozialwissenschaften/Sozialkunde	social sciences/civics
Sportwissenschaft/Leibeserziehung	sport sciences/physical education

APPENDIX 6. Disciplines for Teaching Careers at Gymnasien, Realschulen, and Vocational Schools and for Teaching Careers at the Lower and Upper Level of Secondary Schools continued

Sprachwissenschaft/Linguistik	language theory/linguistics
Technologie	technology
Theologie, evangelisch	theology, Protestant
Theologie, katholisch	theology, Catholic
Textilgestaltung	textile design
Vermessungswesen	geodesy
Volkskunde	cultural anthropology
Wirtschaftswissenschaften	economics

APPENDIX 7. Disciplines Leading to the Diplom at Universities and Technical Universities (including Technische Hochschulen)

(as of July 1977)	
Agrarbiologie	agrobiology
Agrarökonomie	agricultural economics
Agrarwissenschaft	agriculture
Architektur	architecture
Astronomie	astronomy
Bauingenieurwesen	civil engineering
Bauproduktion und Bauwirtschaft	building and contracting
Bergbau	mining
Betriebswirtschaftslehre	business administration
Bibliothekswissenschaft	library science
Biochemie	biochemistry
Biologie	biology
Brauwesen/Getränketechnologie	brewing/beverage technology
Brennstoffingenieurwesen	fuel engineering
Chemie	chemistry
Chemieingenieurwesen/ Verfahrenstechnik/Chemietechnik	chemical engineering
Datentechnik	data processing technology
Dolmetscher/Übersetzer	interpreting/translating
Elektrotechnik	electrical engineering
Fertigungstechnik	manufacturing technology
Flugtechnik/Luftfahrttechnik	aerodynamics/aviation technology
Forstwissenschaft	forestry
Gartenbau	horticulture
Geographie	geography
Geologie/Paläontologie	geology/paleontology
Geophysik	geophysics
Haushalts- und Ernährungswissenschaft (Ökotrophologie)	home economics and nutrition

APPENDIX 7. Disciplines Leading to the Diplom at Universities and Technical Universities (including Technische Hochschulen) continued

Holzwirtschaft	wood technology and management
Hüttenwesen	metallurgical engineering
Informatik	computer and information sciences
Kommunikationswissenschaft	communication sciences
Landespflege/Landschaftsgestaltung	soil conservation/land use
Landschaftsplanung	landscape architecture
Lebensmitteltechnologie	food technology
Limnologie	limnology
Markscheidewesen	mine surveying
Maschinenbau	mechanical engineering
Mathematik	mathematics
Medizinische Informatik	medical information sciences
Metallkunde	metallurgy
Meteorologie	meteorology
Mikrobiologie	microbiology
Mineralogie	mineralogy
Ozeanographie	oceanography
Ökonomie	agricultural economics
Pädagogik	education
Papieringenieurwesen	paper technology
Physik	physics
Physikalische Ingenieurwissenschaft	physical engineering
Politologie	political science
Psychologie	psychology
Raumplanung	regional planning
Schifftechnik	naval engineering
Socialpädagogik	social pedagogy
Sozialwissenschaften/Sozialkunde	social sciences/social studies
Soziologie	sociology
Sportwissenschaft/Leibeserziehung	sport sciences/physical education
Staatswissenschaften/ Verwaltungswissenschaften	government and public administration
Statistik	statistics
Theologie (evangelisch)	theology, Protestant
Theologie (katholisch)	theology, Catholic
Umwelttechnik	environmental technology
Vermessungswesen	geodesy
Volkswirtschaftslehre	political economy
Werkstoffwissenschaften	materials technology
Wirtschaftsingenieurwesen	industrial engineering
Wirtschaftspädagogik	business and commerce education
Wirtschaftswissenschaften	economics
Wirtschafts- und Organisationswissenschaften	economic and organizational science

APPENDIX 8. Disciplines Leading to the Magister at Universities and Technical Universities (including Technische Hochschulen)

(as of July 1977)

Afrikanistik	African studies
Amerikanistik	American studies
Altamerikanistik	early American studies
Lateinamerikanistik	Latin American studies
Anglistik/Englisch	Anglistics/English
Archäologie	archeology
Balkanologie	Balkan studies
Baltische Philologie	Baltic philology
Bibliothekswissenschaft	library science
Bildungsökonomie	economics of education
Biologie	biology
Byzantinistik	Byzantine studies
Dokumentationswissenschaft	documentation science
Finno-Ugristik	Finno-Ugristics
Geographie	geography
Germanistic	Germanics
Niederländische Philologie	Dutch philology
Skandinavistik	Scandinavian studies
Geschichte	history
Ur-, Vor-, Frühgeschichte	prehistory, early history
Ost-, Südosteuropäische Geschichte	East European, Southeast European history
Geschichte der exakten Wissenschaften	history of the exact sciences
Indologie	Indian studies
Judaistik	Judaic studies
Keltologie	Celtic studies
Klassische Philologie	classical philology
Mittellateinische Philologie	medieval Latin philology
Kommunikationswissenschaft	communications sciences
Kunstgeschichte/Kunstwissenschaft	art history/fine arts
Kunsterziehung/Künstlerisches Werken	art education/applied arts
Indische Kunstgeschichte	art history of India
Allgemeine/Vergleichende Literaturwissenschaft	general/comparative history
Musikwissenschaft/Musikerziehung	musicology/musical education
Vergleichende Musikwissenschaft	comparative musicology
Nordistik	Nordic studies
Orientalistik	Oriental studies
Ost- und Südostasienkunde	East Asian and Southeast Asian studies

APPENDIX 8. Disciplines Leading to the Magister at Universities and Technical Universities (including Technische Hochschulen) continued

Pädagogik	education
Philosophie	philosophy
Phonetik und Sprechkunde	phonetics and speech
Politologie	political science
Psychologie	psychology
Publizistik/Zeitungswissenschaft/ Journalismus	printed media/journalism
Religionswissenschaft	phenomenology of religion
Romanistik	Romance studies
Slawistik	Slavic studies
Sozialwissenschaften/Sozialkunde	social sciences/social studies
Soziologie	sociology
Sportwissenschaft/Leibeserziehung	sport sciences/physical education
Sprachwissenschaften/Linguistik	language theory/linguistics
Staatswissenschaften/ Verwaltungswissenschaften	government and public administration
Theaterwissenschaften	dramatic arts
Theologie (evangelisch)	theology, Protestant
Evangelische Religionspädagogik	Protestant religious education
Theologie (katholisch)	theology, Catholic
Katholische Religionspädagogik	Catholic religious education
Völkerkunde/Ethnologie	ethnology
Volkskunde	cultural anthropology

APPENDIX 9. Disciplines Which Can Be Terminated with the Magister or Diplom Examinations at Universities and Technical Universities (including Technische Hochschulen)

(as of July 1977)	
Bibliothekswissenschaft	library science
Biologie	biology
Geographie	geography
Kommunikationswissenschaft	communication sciences
Pädagogik	education
Politologie	political science
Psychologie	psychology
Sozialwissenschaften/Sozialkunde	social sciences/social studies
Soziologie	sociology
Sportwissenschaft/Leibeserziehung	sport sciences/physical education
Staatswissenschaften/ Verwaltungswissenschaften	government and public administration
Theologie (evangelisch)	theology, Protestant
Theologie (katholisch)	theology, Catholic

APPENDIX 10. Pädagogische Hochschulen (Teacher Training Institutions) in the Federal Republic of Germany

(as of July 1977)	
Pädagogische Hochschule Rheinland	Aachen, Bonn, Cologne, Neuss
Pädagogische Hochschule Westfalen-Lippe	Bielefeld, Münster
Pädagogische Hochschule	Berlin
Pädagogische Hochschule Niedersachsen	Braunschweig, Göttingen, Hanover, Hildesheim, Lüneburg
Pädagogische Hochschule Ruhr	Dortmund/Hagen
Pädagogische Hochschule	Esslingen
Pädagogische Hochschule	Flensburg
Pädagogische Hochschule	Freiburg
Pädagogische Hochschule	Heidelberg
Pädagogische Hochschule	Karlsruhe
Pädagogische Hochschule	Kiel
Erziehungswissenschaftliche Hochschule Rheinland-Pfalz	Koblenz/Landau/Mainz/Worms
Pädagogische Hochschule	Lörrach
Pädagogische Hochschule	Ludwigsburg
Pädagogische Hochschule	Reutlingen
Pädagogische Hochschule	Saarbrücken
Pädagogische Hochschule	Schwäbisch Gmünd
Berufspädagogische Hochschule	Stuttgart
Pädagogische Hochschule	Weingarten

APPENDIX 11. Staatliche Kunsthochschulen (State Academies of Fine Arts) and Staatliche Musikhochschulen (State Academies of Music) in the Federal Republic of Germany

(as of July 1977)

Hochschule der Künste	Berlin
Staatliche Hochschule für bildende Künste	Braunschweig
Hochschule für bildende Künste	Düsseldorf
Staatliche Hochschule für bildende Künste	Frankfurt
Hochschule für bildende Künste	Hamburg
Staatliche Akademie der bildenden Künste	Karlsruhe
Akademie der bildenden Künste	Munich
Hochschule für Fernsehen und Film (Academy of Television and Motion Pictures)	Munich
Akademie der bildenden Künste	Nuremberg
Hochschule für Gestaltung (Academy of Design)	Offenbach
Staatliche Akademie der bildenden Künste	Stuttgart
Staatliche Hochschule für Musik Westfalen-Lippe	Detmold/Dortmund/ Münster
Staatliche Hochschule für Musik, Ruhr-Institut	Essen/Duisburg
Folkwang-Hochschule für Musik, Theater, Tanz	
Hochschule für Musik und darstellende Kunst (State Academy of Music and Performing Arts)	Frankfurt
Staatliche Hochschule für Musik	Freiburg
Hochschule für Musik und darstellende Kunst	Hamburg
Staatliche Hochschule für Musik und Theater	Hanover
Staatliche Hochschule für Musik	Heidelberg-Mannheim
Staatliche Hochschule für Musik	Karlsruhe
Staatliche Hochschule für Musik Rheinland	Cologne
Musikhochschule	Lübeck
Hochschule für Musik	Munich
Musikhochschule des Saarlandes	Saarbrücken
Staatliche Hochschule für Musik und darstellende Kunst	Stuttgart
Staatliche Hochschule für Musikerziehung	Trossingen
Hochschule für Musik	Würzburg

APPENDIX 12. State and State-Accredited Fachhochschulen in the Federal Republic of Germany[1]

(as of July 1977)

Fachhochschule	*Aachen*/Jülich[2]
Fachhochschule	Aalen
Fachhochschule für Verwaltung	Altenholz
(F. for Administration)	
Fachhochschule	Augsburg
Fachhochschule für Sozialarbeit und Sozialpädagogik	Berlin
(F. for Social Work and Social Pedagogy)	
Fachhochschule für Technik	Berlin
(F. for Engineering)	
Fachhochschule für Wirtschaft	Berlin
(F. for Business and Commerce)	
Fachhochschule für Verwaltung und Rechtspflege	Berlin
(F. for Administration and Judicial Administr.)	
Fachhochschule der Deutschen Bundespost	Berlin
(F. of the German Federal Postal Service)	
Evangelische Fachhochschule für Sozialarbeit und Sozialpädagogik	Berlin
(Protestant F. for Social Work and Social Pedagogy)	
Fachhochschule	Biberach
Fachhochschule	Bielefeld/Minden
Fachhochschule	*Bochum*/Gelsenkirchen/ Recklinghausen
Fachhochschule Bergbau der westfälischen Berggewerkschaftskasse	Bochum
(F. for Mining of the Westphalian Miners Union Insurance Fund)	
Evangelische Fachhochschule Rheinland-Westfalen-Lippe	*Bochum*/Bielefeld/ Düsseldorf
(Protestant F. Rhineland-Westphalia-Lippe)	
Fachhochschule	Braunschweig/ Wolfenbüttel
Hochschule für Gestaltung	Bremen
(Academy of Design)	

1. Fachhochschule curriculums are also offered at Gesamthochschulen, the Hochschule der Künste (Berlin), Technische Universität (Munich) and the Hochschule der Bundeswehr (Munich).

2. Main campus or seat of central administration in italics.

APPENDIX 12. State and State-Accredited Fachhochschulen in the Federal Republic of Germany continued

Hochschule für Nautik (School of Nautical Science)	Bremen
Hochschule für Sozialpädagogik und Sozialökonomie (School of Social Pedagogy and Social Economics)	Bremen
Hochschule für Technik (School of Engineering)	Bremen
Hochschule für Wirtschaft (School of Business and Commerce)	Bremen
Hochschule Bremerhaven	Bremerhaven
Fachhochschule Nordostniedersachsen (F. of Northeastern Lower Saxony)	*Buxtehude*/Suderburg
Fachhochschule	*Coburg*/Münchberg
Fachhochschule	Cologne
Rheinische Fachhochschule (F. Rhineland)	Cologne
Katholische Fachhochschule Nordrhein-Westfalen (Catholic F. of Northrhine Westphalia)	*Cologne*/Aachen/Münster/Paderborn
Fachhochschule	Constance
Fachhochschule	*Darmstadt*/Iugenheim
Fachhochschule des Heeres 1 (nur für Offiziere der Bundeswehr) (F. of the Army, only for Armed Forces officers)	Darmstadt
Evangelische Fachhochschule (Protestant F.)	Darmstadt
Fachhochschule der Deutschen Bundespost (F. of the German Federal Postal Service)	Dieburg
Fachhochschule	Dortmund
Fachhochschule	Düsseldorf
Fachhochschule Ostfriesland (F. of Eastern Frisia)	*Emden*/Leer
Fachhochschule für Technik (F. for Engineering)	Esslingen
Fachhochschule für Sozialwesen (F. for Social Studies)	Esslingen
Fachhochschule	Flensburg
Fachhochschule	Frankfurt
Fachhochschule für Sozialwesen und Religionspädagogik beim Deutschen Caritasverband Freiburg (F. for Social Studies and Religious Education of the Deutscher Caritasverband Freiburg)	*Freiburg*/Heidelberg

APPENDIX 12. State and State-Accredited Fachhochschulen in the Federal Republic of Germany continued

Fachhochschule für Sozialwesen, Religionspädagogik und Gemeindediakonie in Freiburg – staatlich genehmigte Fachhochschule der Evangelischen Landeskirche in Baden	Freiburg
(F. for Social Studies, Religious Education and Church Community Work in Freiburg – state-accredited F. of the Protestant Church of Baden)	
Fachhochschule	Fulda
Fachhochschule	Furtwangen
Fachhochschule	*Giessen*/Friedberg
Fachhochschule	*Hagen*/Iserlohn
Evangelische Fachhochschule für Sozialpädagogik der Diakonenanstalt des Rauhen Hauses	Hamburg
(Protestant F. for Social Pedagogy of the Diakonenanstalt des Rauhen Hauses)	
Fachhochschule	Hamburg
Hochschule für Wirtschaft und Politik	Hamburg
(School of Business and Politics)	
Fachhochschule	*Hanover*/Nienburg
Evangelische Fachhochschule	Hanover
(Protestant F.)	
Fachhochschule beim Berufsförderungswerk Heidelberg, Träger: Stiftung Rehabilitation	Heidelberg
(F. of the Project for the Promotion of Job Skills Heidelberg, attached to the Stiftung Rehabilitation)	
Fachhochschule	Heilbronn
Fachhochschule	*Hildesheim-Holzminden*/ Göttingen
Naturwissenschaftlich-Technische Akademie Prof. Dr. Grübler	Isny
(Academy of Science and Technology)	
Fachhochschule	Karlsruhe
Fachhochschule für öffentliche Verwaltung	Kehl
(F. for Public Administration)	
Fachhochschule	*Kiel*/Eckernförde
Fachhochschule Niederrhein	*Krefeld*/ Mönchengladbach
(F. Lower Rhine)	
Fachhochschule Lippe	*Lemgo*/Lage/Detmold

APPENDIX 12. State and State-Accredited Fachhochschulen in the Federal Republic of Germany continued

Fachhochschule der Pfälzischen Landeskirche (F. of the Church of the Palatinate)	Ludwigshafen
Fachhochschule	Lübeck
Fachhochschule des Landes Rheinland-Pfalz (F. of the State of Rhineland-Palatinate)	*Mainz*/Bingen/Bad Kreuznach/Kaiserslautern/Höhr-Grenzhausen/Koblenz/Ludwigshafen/Rengsdorf/Trier
Katholische Fachhochschule für Sozialarbeit, Sozialpädagogik und praktische Theologie (Catholic F. for Social Work, Social Pedagogy and Practical Theology)	Mainz
Städtische Fachhochschule für Gestaltung (Municipal F. for Design)	Mannheim
Fachhochschule für Sozialwesen (F. for Social Studies)	Mannheim
Fachhochschule für Technik (F. for Engineering)	Mannheim
Fachhochschule der Bundesanstalt für Arbeit (F. of the Federal Employment Agency)	Mannheim
Fachhochschule	Munich
Stiftungsfachhochschule (Religious Foundation F.)	*Munich*/Benediktbeuren
Fachhochschule	*Münster*/Steinfurt
Fachhochschule	Nuremberg
Stiftungsfachhochschule Nürnberg – Fachhochschule der Evangelischen Erziehungsstiftung (F. of the Protestant Foundation for Education)	Nuremberg
Fachhochschule	Nürtingen
European Business School	Offenbach
Fachhochschule	Offenburg
Fachhochschule	*Oldenburg*/Elsfleth
Fachhochschule	Osnabrück
Katholische Fachhochschule Norddeutschland (Catholic F. for Northern Germany)	*Osnabrück*/Vechta
Fachhochschule für Gestaltung (F. for Design)	Pforzheim
Fachhochschule für Wirtschaft (F. for Business and Commerce)	Pforzheim
Fachhochschule	Ravensburg
Fachhochschule	*Regensburg*/Landshut/Selb/Zwiesel
Fachhochschule	Reutlingen

APPENDIX 12. State and State-Accredited Fachhochschulen in the Federal Republic of Germany continued

Evangelische Fachhochschule für Sozialwesen (Protestant F. for Social Studies)	Reutlingen
Fachhochschule	Rosenheim
Fachhochschule des Saarlandes	Saarbrücken
Katholische Fachhochschule für Sozialwesen (Catholic F. for Social Studies)	Saarbrücken
Fachhochschule	Schwäbisch Gmünd
Fachhochschule	Sigmaringen
Fachhochschule für Bibliothekswesen (F. for Library Science)	Stuttgart
Fachhochschule für Druck (F. for Printing)	Stuttgart
Fachhochschule für Technik (F. for Engineering)	Stuttgart
Fachhochschule für öffentliche Verwaltung (F. for Public Administration)	Stuttgart
Fachhochschule	Ulm
Staatlich anerkannte Fachhochschule für physikalische Technik und Informationstechnik und Schule für physikalisch-technische und mathematisch-technische Assistenten (State-Accredited F. for Physical Technology and Information Systems and School for Technical Assistants in Physics and Mathematics)	Wedel (Holstein)
Fachhochschule	*Weihenstephan*/Freising/ Schönbrunn bei Landshut/Triesdorf
Fachhochschule	*Wiesbaden*/Geisenheim/ Idstein/Rüsselsheim
Fachhochschule Fresenius	Wiesbaden
Fachhochschule	Wilhelmshaven
Fachhochschule	*Würzburg*/Schweinfurt

APPENDIX 13. List of the Accredited Disciplines in Which a Final Examination (Abschlußprüfung) Can Be Taken at Fachhochschulen

(as of July 1977)

Architektur	architecture
Bauingenieurwesen	civil engineering
Bergbau	mining
Hüttentechnik	metallurgical engineering
Chemie/Technische Chemie	chemistry/chemical engineering
Druck- und Reproduktionstechnik/ Druckereitechnik	printing and reproduction technology
Elektrotechnik	electrical engineering
Fahrzeugtechnik	automotive engineering
Feinwerktechnik	precision instruments engineering
Forstwirtschaft	forestry
Gartenbau	horticulture
Holztechnik	wood technology
Keramik/Glastechnik	ceramic and glass technology
Kerntechnik/Kernverfahrenstechnik	nuclear technology/nuclear engineering
Kunststofftechnik	plastics technology
Landbau/Weinbau	agriculture/viniculture
Landespflege	soil conservation
Lebensmitteltechnologie/ Getränketechnologie	food technology/beverage technology
Luftfahrzeugtechnik	aircraft technology
Maschinenbau	mechanical engineering
Milch- und Molkereiwirtschaft	milk production/dairy technology
Physik/Physikalische Technik	physics/physical engineering
Produktionstechnik/Arbeitslehre	manufacturing technology/human engineering
Schiffbau	shipbuilding
Schiffbetriebstechnik	naval technology
Stahlbau/Metallbau/Leichtbau	steel construction/metal construction/light metals construction
Technisches Gesundheitswesen	health technology
Textiltechnik/Bekleidungstechnik/ Bekleidungsindustrie	textile technology/garment technology/garment industry
Verfahrenstechnik	chemical engineering
Vermessungstechnik/ Vermessungswesen	surveying technology/geodesy
Versorgungstechnik/Energie- und Wärmetechnik	energy, thermal and water supply technology
Werkstofftechnik	materials technology
Ernährung und Hauswirtschaft/Ernährungs- und Haushaltstechnik	nutrition and home economics/ nutrition and domestic technology

APPENDIX 13. List of the Accredited Disciplines in Which a Final Examination (Abschlußprüfung) Can Be Taken at Fachhochschulen continued

Innenarchitektur	interior design
Seefahrt/Nautik	navigation and nautical science
Wirtschaftsingenieurwesen	industrial engineering
Fremdsprachen/Sprachen	foreign languages/linguistics
Gestaltung/Design	industrial design
Informatik	computer and information sciences
Mathematik	mathematics
Bibliothekswesen	library science
Religionspädagogik und kirchliche Bildungsarbeit	religious pedagogy and teacher education
Sozialwesen/Sozialpädagogik/ Sozialarbeit	social science/social pedagogy/ social work
Wirtschaft/Betriebswirtschaft	economics/business administration
Arbeits- und Berufsberatung	career and job counseling
Verwaltung	administration
Rechtspflege	administration of justice

APPENDIX 14. List of Designations of Graduation Degrees *(FHS Graduierung)* as Awarded by Fachhochschulen

(Information as of July 1977)

Ingenieur (grad.):	in 32 engineering disciplines (Appendix 12, items 1-32)
Ingenieur (grad.)/ Oecotrophologe (grad.):	für Ernährungs- und Hauswirtschaft/Ernährungs- und Haushaltstechnik (Nutrition and Home Economics, Household Technology
Wirtschaftsingenieur (grad.) für Seeverkehr	für Seefahrt/Nautik (Nautics)
Ingenieur (grad.)/ Designer (grad.):	für Innenarchitektur (Interior design)
Wirtschaftsingenieur (grad.):	für Wirtschaftsingenieurwesen (Industrial engineering)
Dolmetscher (grad.)/ Übersetzer (grad.):	für Fremdsprachen (Foreign language interpreter/translator)
Designer (grad.):	für Gestaltung/Design (Design)
Informatiker (grad.):	für Informatik (Computer science)
Mathematiker (grad.):	für Mathematik
Diplombibliothekar	für Bibliothekswesen (Librarian)
Religionspädagoge (grad.):	für Religionspädagogik und kirchliche Bildungsarbeit (Religious instruction and church-related social service)
Sozialarbeiter (grad.)/ Sozialpädagoge (grad.)	für Sozialwesen/Sozialpädagogik/ Sozialarbeit (Social Service, Special Education, Social Work)
Betriebswirt (grad.):	für Betriebswirtschaft/Wirtschaft (Business administration/economics)
Verwaltungswirt (grad.):	für Arbeits- und Berufsberatung und Verwaltung (Vocational guidance counseling and administration)
Rechtspfleger (grad.):	für Rechtspflege (Legal guidance counseling)

APPENDIX 15. Contents of Curriculums for Teacher Training by Selected Examples

1. Teaching careers at Gymnasien

General Regulations on the Standards for the State Examination (Rahmenbestimmungen zu den Anforderungen für die wissenschaftlichen Prüfungen) (Resolution of the Conference of Ministers of Education of May 21, 1970)

1.1 Mathematics as major

I. Prerequisites for Admission

For mathematics minors: Successful participation in four exercise courses, one introductory seminar and one advanced seminar course; an introductory seminar may be substituted for an exercise course. Exercise courses can be substituted by an introductory seminar. For mathematics majors: an additional seminar.

II. Minimum academic work

For mathematics minors: Analysis I–III with exercises. Linear algebra and analytical geometry with exercises. Mathematical lab or numerical mathematics or theory of probabilities. Knowledge of contents of four lecture courses (about 4 credit hours each) from three of the following areas:

A. Calculus and general topology
B. Geometry
C. Algebra and theory of numbers
D. Numerical mathematics and computer science
E. Probabilities and statistics
F. Foundations of mathematics, mathematical logic, history of mathematics

Seminars and exercise courses.

For mathematics majors: In addition to the requirements mentioned, contents of two further lecture courses, a further seminar, and individual study of the literature, especially that needed in preparation of the major paper.

III. Proctored tests (Klausur)

The individual examination regulations may provide proctored tests. They must make possible a choice from different areas. If mathematics majors do not write their major paper in the field of mathematics, two proctored tests are obligatory.

IV. Standards for the oral examination

A. Comprehension of problems and methods in the chosen areas of the 2nd segment of studies, based on knowledge of basic terms from algebra, calculus and general topology.
B. Knowledge in the area of applied mathematics.
C. For mathematics majors: in addition to those mentioned, in-depth knowledge is required in the area which the candidate has chosen as area of emphasis.

APPENDIX 15. Contents of Curriculums for Teacher Training by Selected Examples continued

1.2 Chemistry

I. Prerequisites

First segment of studies:

A. Two semesters chemical lab (20 hours/week each), to study the foundations of inorganic, organic and physical chemistry. About half of the time should be devoted to inorganic chemistry, the other half to organic and physical chemistry.
B. Physics course (4 credit hours) for students of chemistry.
C. Mathematics for science students with exercises (total of 5 credit hours, of these 2 for exercises).

Second segment of studies:

D. Courses (12 credit hours), of these at least 4 hours exercises in presentation with demonstrations in inorganic, organic and physical chemistry.
E. Participation in excursions to chemical and technical plants.
F. Participation in specialized lab (16 credit hours minimum) during the final academic year, if the major paper (*Prüfungsarbeit*) is to be written in chemistry.

II. Standards/requirements

A. In-depth knowledge in inorganic, organic and physical chemistry, with particular consideration for materials covered in the 2nd segment of studies; emphasis to be given to general laws and principles.
B. Knowledge in and comprehension of the application of chemistry in technology and in some basic chemical-technological processes. Comprehension of the significance of chemical processes in nature. Insights into the development of some basic problems of chemistry.

III. Procedure in the oral examination

A. Chemistry majors will be examined in all three areas of chemistry (inorganic, organic, physical).
Chemistry minors elect two of the areas. In the third area they submit proof of adequate training by the presentation of certificates.
B. When applying for admission to the examination candidates may indicate a special topic (from a catalog to be established by the university) for each of the three areas of chemistry (inorganic, organic, physical). These specialties will be considered in the examination.

IV. Major paper (*Staatsexamensarbeit*)

The topic for the major paper can be taken, with concurrence of the board of examiners, from the entire field of chemistry.

V. Proctored tests (*Klausur*)

The required test is a non-experimental test; the time allowed is 5 hours. The test contains a large number of questions testing comprehension in the areas of inorganic, organic and physical chemistry; it is also possible that one topic from each of the three areas can be assigned for thorough treatment.

APPENDIX 15. Contents of Curriculums for Teacher Training by Selected Examples continued

1.3 Physics

I. Prerequisites for admission

Minimum academic work during entire period of studies in physics:

A. Lecture courses on experimental physics totalling about 16 credit hours. These lectures deal with the foundations of classical physics, atomic physics, nuclear physics, solid state physics and application of physics.

B. Lectures on theoretical physics, totalling about 12 credit hours. These lectures deal with the most important questions in mechanics, electrodynamics and quantum mechanics and possibly also in thermodynamics and the theory of relativity.

C. Successful participation in at least three exercise courses, at least one of which on theoretical physics.

D. One seminar course.

E. Physical laboratory of about 10 hours/week.

F. An advanced laboratory of 8 hours/week, in which the independent construction of experiments/demonstrations shall be taught *(Demonstrationspraktikum)*

G. For physics majors participation in further lectures and in a further laboratory or a further seminar is required. These courses should be selected so as to provide an introduction to that area of physics from which the topic of the major paper *(wissenschaftliche Arbeit)* is to be selected.

II. Examination requirements

A. Proctored tests (Klausur): none

B. Oral examination (two examiners)

Experimental physics:

Knowledge of basic facts and laws of physics and acquaintance with the most important applications.

Theoretical physics:

Comprehension of fundamental principles of theoretical physics and in-depth knowledge in an area of theoretical physics to be chosen by the candidate. Classic mechanics cannot be chosen as area of in-depth knowledge.

Survey on the historical development of physics.

For physics majors, there is an additional requirement of in-depth knowledge in the area of physics from which the topic of the major paper had been chosen.

1.4 English

I. Prerequisites

A. Knowledge of Latin

B. Successful participation in two advanced seminar courses.

C. If possible, a stay of at least three months in an English speaking country.

D. Depending on the courses offered at the universities, participation in courses on current political and social affairs in Great Britain or the US.

APPENDIX 15. Contents of Curriculums for Teacher Training by Selected Examples continued

II. Examination requirements

A. Language proficiency

Confidence in the written and oral use of the English language; including knowledge of the correct pronunciation. Capacity to comprehend difficult texts without dictionaries. Inadequate mastery of the language cannot be made up by better performances in other parts of the examination.

Note: For practical purposes pronunciation shall be oriented towards forms known by the terms "Received Pronunciation" and "General American." Major interferences of the mother tongue are not acceptable.

B. Linguistics

1. Familiarity with linguistic methods and their application in areas chosen from current English which must include publications on phonetics and grammar of relevance to teaching. Knowledge of main differences between British and American English.
2. Knowledge of the most important structural changes of the English language in the course of its history; emphasis to be given to one period chosen by candidate (old, middle, and early new English). Capability to comprehend and to comment on a text from the chosen period. Dictionaries may be used.

C. Literature

1. Familiarity with the methods of the study of literature and confidence in the interpretation of literary texts.
2. Knowledge of the most important epochs of English and American literature, on the basis of individually chosen texts.

Familiarity with works of contemporary literature. More detailed knowledge in the period selected, but as a rule literature beginning with Shakespeare: important cultural, social and political literature shall be included.

III. Procedure of examination

A. Major and minor area

Of the two areas language and literature the candidate elects one as major area, the other as minor area.

B. Major paper *(Hausarbeit)*

The topic of the major paper is generally taken from the major area. As a rule, the major paper is to be written in German.

C. Proctored tests *(Klausur)*

Two tests which may consist of several parts are required. The total time allowed shall be at least 6 hours, maximum 8 hours. Indispensable are a translation from German into English and an examination on the capacity of free English expression. A composition in German and the application of new testing forms are permissible.

D. Oral examination

1. Objects of the oral examination are the areas listed in Section II, above. The oral examination gives emphasis to areas to which candidate and examiner have agreed.

Candidates will be examined in two topics in the major areas of knowledge

selected (see III A above) and in one topic of the minor.
2. For English majors, a 4th topic of emphasis will be added from the topic of the major paper.
3. In order to ascertain language proficiency, it is required that a part of the oral examination be held in English.

1.5 Economics (Wirtschaftskunde)

I. Prerequisites

A. Successful participation in courses in the following areas, unless evidence is presented of successfully passed intermediate examination:
   a) Principles of Economics
   b) Principles of business administration
   c) Techniques of accounting
   d) Mathematics for economics students
   e) Statistics
   f) Law

   For candidates taking economics as a minor evidence of prior knowledge in items d through f is waived.

B. Successful participation in a seminar or equivalent course in both economics and business administration.

II. Examination requirements

In the examination the candidate shall give evidence that he has acquired the knowledge and capabilities essential for the discussion and evaluation of economic problems. Required knowledge extends to the following areas:

A. Economics (including economic policies and public finance). In particular knowledge has to be shown in:
   1. Principles of the economic system, central institutions of economic policies and data,
   2. Theory of prices and markets,
   3. Monetary economics and public finance,
   4. National income and national income accounting,
   5. Balance of payments and international economics.

B. Business administration (including accounting and decisions). In particular knowledge has to be shown in:
   1. Balances and quantitative business analysis,
   2. Cost accounting,
   3. Finance and investments,
   4. Production and marketing

III. Proctored tests (*Klausur*)

The candidate has to write a test of four to five hours' duration. As a rule, the topic will be taken from the area of economics, there will be at least two topics to choose from.

IV. Oral examination

The oral examination covers economics and business administration. Candi-

dates who have chosen economics as a major will indicate three subjects of emphasis from items II/A and B; candidates having economic studies as a minor indicate one subject of emphasis each from II/A and B.

2. Teaching careers at Realschulen

2.1 Sample for the distribution of credit hours among the different areas of studies (recommended standard at Pädagogische Hochschule Freiburg):

Education Courses	
General education	4–5
Secondary School education	8–11
Psychology	4–6
Elective from philosophy, political science, sociology, theology	4
Subject Courses	
1st subject (major)	45
2nd subject (minor)	45
Methodology (didactics) of subject teaching	10
Practice teaching	10

2.2 Information on contents of studies

2.2.1 Mathematics
(Excerpt from the "Prüfungs- und Ausbildungsordnung für das Lehramt an Realschulen in Bayern" of July 31, 1973)

I. Prerequisites
The applicant for the final examination must submit proof of successful participation in the following courses:
a) Exercise course in linear algebra, with tests,
b) Exercise course in geometry, see para II(A)3 below,
c) Exercise course in calculus, with tests,
d) Practical course in the area of electronic data processing or a further exercise course or introductory seminar.

Proof may also be substantiated by a certificate attesting to the successful passing of the intermediate examination for teaching careers at Gymnasien, or by the certificate attesting to successful passage of the intermediate examination *(Vordiplomprüfung)* at a university in mathematics or physics or computer science or engineering, provided four semesters of mathematics had been included in the curriculum.

II. Examination requirements
A. Subject knowledge:
1. Foundations of theory of sets, basic mathematical structures, structure of the system of numbers.

2. Linear algebra, foundations of the theory of numbers.
3. Synthetic analytical geometry of the plane and space; graphic geometry (orthogonal and general parallel projections).
4. Differential and integral calculus of one variable, elementary functions, elementary operations in differential equations, linear differential equations of first order.
5. Elements of probability theory and statistics.

B. Application and history of mathematics
1. Insights into electronic data processing.
2. Insights into the history of mathematical problems.

III. Written examination

A. One problem or group of problems from among the areas mentioned in para. II(A)(2 and 3) (4 hours).

B. One problem or problem group from the area of para II(A)(4) (4 hours).

2.2.2 Chemistry

(Excerpt from "Ausbildungs- und Prüfungsordnung für das Lehramt an Realschulen in Baden-Württemberg," 8/30/72)

I. Prerequisites

Participation in one laboratory course each on inorganic and organic chemistry with exercises in qualitative and quantitative analysis and preparative exercises. Participation in course on demonstration of experiments for school teaching. Participation in a physics laboratory. Participation in a laboratory on physical chemistry or biochemistry. Participation in an introduction to problems of teaching chemistry.

II. Academic Requirements

A. Knowledge of the basic facts of general chemistry, of inorganic and organic chemistry as well as of foundations of physical chemistry and biochemistry.

B. Familiarity with the most important methods of working and thinking in chemistry.

C. Insights into the basic problems of teaching chemistry.

III. Proctored tests (*Klausur*)

In the written examination three problems (groups of problems) are given; of these one must be taken. Time allowed is 4 hours.

IV. Oral examination

The examination lasts for about 30 minutes.

2.2.3 Physics

(Excerpt from "Prüfungs- und Ausbildungsordnumg für das Lehramt an Realschulen in Bayern," of July 31, 1973)

I. Prerequisites

The applicant for the examination must submit proof of successful participation

in two courses of physics laboratories for beginners. This proof may be substantiated by a certificate of successful completion of the intermediate examination *(Vorprüfung or Diplomvorprüfung)* in mathematics or physics or engineering.

II. Examination requirements

A. Knowledge of the more important facts and laws in all areas of experimental physics, of their significance to natural phenomena and their most important applications in technology; insights into the processes of physical research; survey of more modern questions in experimental physics and their historic development.

B. Acquaintance with the most important equipment and methods of measuring; exercises in practical experiments and in the evaluation of measurement results (data).

III. Written examination

Two problems or groups of problems from the areas as in para. II (two hours each).

IV. Practical examination

One practical problem to be solved by experiment (3 hours).

V. Grading

In establishing the final grade for the subject, the written examination counts twice, the practical and oral examinations once each.

2.2.4 English

(Excerpt from "Ordnung der Ersten Staatsprüfung für die Laufbahn der Realschullehrer in Schleswig-Holstein," of 2/10/1976)

I. Prerequisities

1.1. Participation in courses of a total of at least 48 credit hours; evidence through student records.

1.1.1. academic courses in language, literature and civilization to the extent of at least 30 credit hours,

1.1.2. practical language exercises to the extent of at least 12 credit hours, meaning as a rule:

Ear Training and practical exercises in phonetics,

Précis or Essay Writing or Composition,

Translation exercises (English-German and German-English),

Pronunciation exercises in American and British English,

1.1.3. Methodological courses of at least 6 credit hours,

extended stay abroad is urgently recommended.

1.2. To substantiate the completion of the requirements of 1.1.1, above, evidence must be produced to prove successful completion of the following:

1.2.1. in the initial segment of the program (Grundstudium):

1.2.1.1. one practical language exercise (translation German-English),

1.2.1.2. one practical language exercise (précis or composition),
1.2.1.3. one introductory seminar in linguistics,
1.2.1.4. one introductory seminar in literature;
1.2.2. in the second segment of the program (Hauptstudium):
1.2.2.1. one advanced seminar in language or literature,
1.2.2.2 one free introductory seminar or advanced seminar in civilization or methodology of teaching the subject.

II. Examination requirements
2.1. Language Proficiency:
Firmness in the oral and written use of the English language.
2.2. Linguistics:
Familiarity with problems, methods and results of linguistics. In-depth knowledge in three selected areas
2.3. Literature:
Knowledge of problems, methods and results of the study of literature. Capability to analyze and interpret literary texts. Familiarity with one Shakespeare play, with selected works of two or three authors in English and American literature, mainly from the 19th and 20th centuries, and with one special topic (e.g. typology, comparative topic, topic from prose or trivial literature).
2.4. Civilization:
Presentation of a special area chosen by the candidate in historical, political, sociological or geographic perspective, depending on the topic chosen.
2.5. Knowledge of basic problems of the methodology of teaching English; capability to apply methodological categories to the various parts of English language study.

III. Written examination
3.1. Translation of a text from German prose into English
Time allowed: 2 hours
3.2. An essay in English, to be chosen from three given topics. An English dictionary may be used.
Time allowed: up to 4 hours, depending on kind of topic.

IV. Oral examination
The orals are based on topics selected by the candidate from language, literature, civilization and methodology of teaching English. A part of the oral examination will be conducted in English. Deficiencies in language proficiency cannot be made up by other parts of the examination.
Duration: 30 to 45 minutes.

2.2.5. Economics
(Excerpt from the tentative curriculum of the "Vorlaufige Studienordnung der Gesamthochschule Essen," of 6/6/1974)
See accompanying chart, "Recommended Curriculum," on facing page.

Recommended Curriculum: Hauptschule Realschule, Gymnasium (2nd subject)

Semester	*Economics*	*Business Administr.*	*Other subjects**	*Educ'l subj.*	*hours/week*
1	Principles of micro and macro economics 4	Firms as centers of social action 2			6
2	Econ. policies, Econ. systems 2	Household as center of social action 2	– pol. economy – principl. sociology – theory of knowledge – environmt'l studies 2	Interdiscipl. project of education and social sc.** (2)	6 + (2)
3	Control of economic processes 2	Strategies of demand & supply (marketing) 2	– Statistics – pol. economy – law I – econ & soc. history – econ. geography – pol. science – environmt'l studies 2	project in teaching subj. 2	8
4	Price policies and competition 2 Bus. cycles and employment 2	Managerial and decision processes in firms (co-determination 2	– econ & soc. history – consumer & industr'l sociology – pol. science – statistics II – occupat'l studies – law II – history of econ thought 2	project in teaching subj. 2	10
5	Income and property distribution 2	Selected Problems (labor and vocation) 2		project in teaching subj. 2	6
6[1]	Growth & development 2			project in teaching subj. 2	4
Total	16	10	6	8 + (2)	40 + 2

* Required elective, 2 credit hours by free choice; ** courses of departments 1, 2 and 5

[1] Hauptschule/Realschule: studies end with 6th semester; Gymnasium with 8th.

APPENDIX 15. Contents of Curriculums for Teacher Training by Selected Examples continued

3. Teaching careers at Grundschulen and Hauptschulen

The curriculum for teaching careers at Hauptschulen in some of the states is still the curriculum for elementary school teachers (Grundschule). The difference between them is in the emphasis given to credit hours in subjects and problems pertaining to Hauptschule (grades 5 through 9) or to Grundschule (grades 1 through 4). Furthermore, the two curriculums, which have the same courses in educational methods, differentiate in the level of subject matter taught.

In other states of the Federal Republic training of Hauptschule teachers has already been adjusted to a uniform curriculum for teachers in the various schools on secondary level I (Hauptschule, Realschule, Gymnasium through grade 10). In these cases the profession is now known as "teacher in secondary level I" (Lehramt in der Sekundarstufe I). In these cases the requirements and contents of curriculums are similar to those explained above for teaching careers at Realschulen. Education courses make up about one third of the course load, e.g. in North Rhein–Westphalia 40 hours/semester of a total of 120.

3.1 Sample guidelines for the distribution of credit hours among the different areas of studies (recommended standard at Pädagogische Hochschule Freiburg). These guidelines do not imply mandatory application.

Subjects	*Hours/Week*
Education Courses	
General education	10
School education	10
Courses on teaching at elementary schools	8
Theology	4
Philosophy	4
Educational psychology	4
Sociology/political science	4
Supplemental subject	6
Subject Courses	
Elective major field	40
Minor field	20
Religious studies (voluntary)	3 or 5
Practice teaching	12
Courses on	
School administration	2
Health education	1
Speech training	1
Laboratory in educational technology (introduction into application of technical teaching aids)	
Course in First Aid	

3.2 *Information on Selected Contents of Studies*

3.2.1 Mathematics

(Excerpt from the examination requirements for teachers "Prüfungsordnung für das Lehramt an Grundschulen und Hauptschulen in Baden-Württemberg," of 1/9/1976)

I. Prerequisites

Participation in at least one test for advanced students.

II. Academic requirements/standards

Elective major:

A. Familiarity with methods of mathematical thinking and terminology as well as with the essential structures of mathematics.
B. Comprehension of basic topics in pure and applied mathematics as offered at teacher training institutions (e.g. theory of sets/New Math, systems of numbers, algebra, calculus, geometry, practical mathematics, statistics, graphic geometry).
C. In-depth knowledge in at least one area of mathematics.

Elective minor

A. Familiarity with methods of mathematical thinking and terminology as well as with essential structures of mathematics.
B. Comprehension of basic topics of pure and applied mathematics as offered at teacher training institutions (e.g. theory of sets/New Math, systems of numbers, algebra, geometry, practical methematics).

3.2.2 Chemistry

(Excerpt from "Prüfungsordnung für das Lehramt an Grund- und Hauptschulen in Baden-Württemberg," of 1/9/1976)

I. Prerequisites

Participation in at least two laboratory courses and one exercise course for advanced students. If neither biology nor physics are taken as minors, participation in a laboratory course in biology or physics must be certified.

II. Academic requirements

Elective major

A. Thorough knowledge of processes and problems of inorganic and organic chemistry as well as of biochemistry as far as significant for practical life.
B. Knowledge of fundamental problems of general, analytic and physical chemistry.
C. In-depth knowledge in one of the areas of chemistry mentioned in A and B.
D. Comprehension of the relations to the neighboring sciences, particularly biology and physics; comprehension of the significance of modern chemistry as one of the foundations of the age of technology.
E. Knowledge of classic methods and practical experience with modern qualitative, quantitative and preparative methods and with the evaluation of their results by selected examples.

F. Capacity to methodically prepare, plan, execute, and evaluate experiments.
G. Familiarity with chemical substances and equipment as used at Hauptschulen as well as knowledge of pertinent safety regulations and of actions in cases of accidents.

Elective minor

A. Knowledge of the most significant processes and problems of inorganic and organic chemistry which have practical application and which may be topics of instruction at Hauptschule.
B. For physics majors basic knowledge in general or physical chemistry is required; biology majors have to give evidence of pertinent knowledge in biochemistry.
C. Detailed study of one of the areas of chemistry mentioned in A and B.
D. Evidence of capability to carry out and sensibly evaluate experiments.
E. Familiarity with chemical substances and equipment as used at Hauptschulen as well as knowledge of pertinent safety regulations and of actions in cases of accidents.

3.2.3 Physics

(Excerpt from "Prüfungsordnung für das Lehramt an Grund- und Hauptschulen in Rheinland-Pfalz," of 8/3/1973)

I. Academic studies

The candidate should have knowledge in the following areas:
- kinematics, dynamics, fields, conservation of energy, oscillations and waves, heat and thermodynamics, electricity and magnetism, optics and acoustics, structure of matter
- physical methods for perception and their significance
- the essential mathematical tools of physics
- current scientific problems/issues and research
- principles of chemistry (basic laws, periodical system, acids, bases, salts, oxidation and reduction, metals and non-metals, hydrocarbons).

In-depth knowledge must be demonstrated in two of the areas mentioned above or the following:
- astronomy, cosmology
- theory of relativity
- computer science/informatics
- electronics
- solid state physics
- plasma physics
- quantum mechanics
- physical theory of science, history of physics

II. Methodology of teaching physics

In the following areas the candidate should have knowledge:
- role of physics in technology, society and work

– methodology of teaching in elementary/secondary schools
– methods of teaching physical interrelationships
– curriculum research
– experimental areas with particular reference to teaching in elementary/secondary schools
– methodological approaches

In-depth knowledge is to be demonstrated in two of these areas.

3.2.4 English

(Excerpt from "Prüfungsordnung für das Lehramt an Grund- und Hauptschulen in Rheinland-Pfalz" of 3/8/1973)

I. Academic studies

The candidate should have knowledge in the following areas:

– Linguistics
  Minimum standard in phonetics: Familiarity with the method and with publications of the London School and mastery of the Broad Transcription
  Thorough knowledge of the English grammar
  Knowledge of the most important terms of modern linguistics
– Literature and literary history
  Familiarity with methods of literary interpretation (including genres and forms of texts) and with the basic terms of literary science. Survey of English and American literature with knowledge of several major works from Shakespeare to the present, with particular consideration of the 19th and 20th centuries
– Civilization
  knowledge of the civilization of Great Britain and the US (political structure, society, education, religion; also in historical perspective).

In-depth knowledge is to be demonstrated in two of these areas.

II. Methodology of teaching English

The candidate should have knowledge in the following areas:

– learning theories with regard to foreign languages
– learning/teaching objectives and curricula
– principles and forms/methods of English instruction
– teaching techniques and media
– organization and structures of teaching units

In-depth knowledge is to be demonstrated in two of these areas.

III. Language proficiency

The candidate should be confident in the oral and written use of the English language. He should be able to comprehend spoken English or American without difficulty, and he should give evidence of good pronunciation by the "Received Pronunciation" method. Deficiencies in language proficiency cannot be made up by other parts of the examination.

APPENDIX 15. Contents of Curriculums for Teacher Training by Selected Examples continued

4. Teaching Careers at Vocational Schools

Excerpt from regulations for the initial state examination for teachers (Verordnung über die Erste Staatsprüfung für das Lehramt an beruflichen Schulen – Handelslehramt of July 31, 1973, Hamburg)

4.1 Mathematics

I. Admission requirements

A. Participation in four introductory lecture courses (with tests) of one semester each; successful completion of three tests.

B. Participation in a practicum at a computer center or in a lecture on the theory of probability.

C. Successful participation in a seminar course.

II. Examination requirements

A. Knowledge of differential and integral calculus, of linear algebra and of analytical geometry, based on the contents of the lecture courses in I.A, above.

B. Knowledge, based on one-semester lecture courses, in algebra, in principles of geometry, in differential equations or in theory of functions (choice of course made by the candidate).

C. Extended proficiency in an area of pure or applied mathematics (by choice of candidate).

III. Proctored tests

Five problems from different areas will be provided, three of which have to be answered. Alternatively, a choice will be offered between two essay topics.
Time allowed is five hours.

4.2 Chemistry

I. Admission requirements

A. Participation in introductory courses in general, in inorganic or in organic chemistry, with consideration of biochemical, physical and technological issues.

B. Participation in an introductory course in general chemical commodity research.

C. Successful participation in beginners' lab course in inorganic chemistry and organic chemistry as well as in a course on chemical experiments in schools.

D. Successful participation in an advanced course each from two of the following areas: general chemistry, inorganic chemistry, organic chemistry, commodity research.

E. Participation in a chemical-technological excursion.

II. Examination requirements

A. Knowledge of fundamental facts in general, inorganic and organic chemistry; familiarity with the chemical structure, chemical propensities and conversion of significant substances and groups of materials.

B. General insight into significant laws and theories in chemistry and into the areas of their application, into significant experimental procedures (methods) of chemical research as well as into significant technical processes and their chemical and physical principles.
C. Survey of several commodities, including their scientific and industrial-economic aspects as well as their use.
D. In-depth knowledge of two of the areas mentioned in I.D, above. Choice of areas rests with the applicant.
E. Knowledge of important consequences of chemistry, their impact upon the environment, their relation to biology, their technical application and their significance for ascertaining continued human existence.

III. Proctored tests
Three different topics are offered for the choice of candidates.
Time allowed: five hours.

4.3 Economics/Business Administration

Excerpt from regulations of the Ministry of Education of Baden-Württemberg about the first state examinations for teachers at commercial/vocational schools, "Verordnung des Kultusministeriums Baden-Württemberg über die Erste Staatsprüfung für das Lehramt an beruflichen Schulen (kaufmännischer oder hauswirtschaftlicher oder gewerblich-nichttechnischer Richtung) of February 25, 1975.

A. Major in Economics/Business Administration

I. Business Administration
1. Prerequisites:
Successful participation in lectures and tests in appropriate preparatory subjects and in general business administration, as required during the segment of basic studies. In the segment of advanced studies the following certificates for successful completion of advanced tests have to be obtained: two certificates in special topics of business administration and one certificate in didactics of business administration or in one of the preparatory subjects.
2. Academic Standards:
a. Mastery of the subject matter in the preparatory subjects;
b. extended proficiency in general and special business administration (choice depending on those special areas sufficiently represented at the Pädagogische Hochschule);
c. capability for analyzing problems of business administration.

II. Economics
1. Prerequisites:
Successful participation in lectures and tests in economic theory, as required during the segment of basic studies; successful participation in a test for advanced students.

APPENDIX 15. Contents of Curriculums for Teacher Training by Selected Examples continued

2. Academic Standards:
   a. capacity to analyze economic problems;
   b. mastery of characteristics of economic theories;
   c. knowledge of principles of economic policy and public finance.

III Law

1. Prerequisites:
   Successful participation in lectures and tests in civil law and commercial law, as required during the segment of basic studies. During the segment of advanced studies, a certificate of successful completion of a test or seminar has to be obtained.
2. Academic standards:
   a. mastery of the basic characteristics of civil, commercial, and trade law;
   b. capability of analyzing legal problems.

APPENDIX 16. Contents of Medical Curriculums

Pre-clinical section of studies (2 years, as a rule). Completion by the medical preliminary examination (ärztliche Vorprüfung)

Contents of studies	1. Physics for medical students and physiology 2. Chemistry for medical students and physiological chemistry 3. Biology for medical students and anatomy 4. Medical psychology and medical sociology
Prerequisites for examination	5 practical tests in the 4 areas mentioned above and 2 courses in anatomy (macroscopic and microscopic) with a total of at least 480 hours. A course on medical terminology of at least 12 hours. Nursing service of 2 months and training in First Aid.
Procedure of examination	Written tests on two days (total 7½ hours) with 300 questions from the 4 areas mentioned above.

1st section of clinical study (1 year, as a rule). Completion by the 1st part of the medical examination

Contents of studies	1. General pathology 2. Foundations of clinical medicine
Prerequisites for examination	8 practical exercise courses with at least 300 hours: 1. Course in general pathology 2. Microbiology laboratory 3. Biomathematics for medical students 4. Course on general clinical examinations in the non-surgical and surgical areas of teaching 5. Laboratory in clinical chemistry and hematology 6. Course on radiology incl. protection 7. Course on general pharmacology and toxicology 8. Practical tests on emergencies and First Aid by doctors of medicine.
Procedure of examination:	Written tests on 2 days (total 6 hours) with 240 questions from the 2 areas mentioned above.

2nd section of clinical study (2 years, as a rule). Completion by the 2nd part of the medical examination

Contents of studies	1. Non-surgical subjects 2. Surgical subjects 3. Neurology 4. Ecological subjects
Prerequisites for examinations	15 courses and practical courses (internships) with at least 480 hours in the areas: special pathology, special pharma-

	cology, internal medicine, pediatrics, dermatology-venerology, urology, surgery, gynecology and obstetrics, orthopaedic surgery, ophthalmology, otorhinolaryngology, neurology, psychiatry, psychosomatic medicine and psychotherapy, ecology.
Procedure of examination	Written tests on 4 days (total 12 hours) with 500 questions on the 4 subjects mentioned above. Certification of a medical clerkship (2 months).

3rd section of clinical study in the form of practical training at a hospital (1 year)

Contents of studies	1. Internal medicine 2. Surgery 3. Elective from one of the other clinical-practical areas
Prerequisites for examinations	Certificate of practical hospital training: this must include evidence for regular participation in training with clinical conferences (including medication-therapeutical and clinical-pathological consultations).
Procedure of examination	*Oral* examination with practical assignments from the clinical-practical areas above (assignments with patients). *Written* tests on 2 days (total 6 hours) with 240 questions from the areas of internal medicine and surgery.

APPENDIX 17. Contents of Curriculums in Law

Two-Stage Program

Contents of studies

Required subjects

1. Civil law
2. Commercial and corporate law
3. Labor law
4. Criminal law
5. Public law
6. Procedural law

Groups of elective subjects (one group of which must be selected):

- Legal history, legal philosophy and legal sociology;
- From the area of voluntary jurisdiction: principles of procedures, custody of children, succession/wills and real estate, international private law;
- Criminology, juvenile delinquency, law enforcement;
- Administration, selected areas of specialized administrative law;
- Constitutional philosophy, international law, law of the European Community;
- Securities, trade law, antitrust law, principles of accounts and balances and tax law;
- In the field of labor law. law of codetermination, co istitutional law with regard to industry, rights of emp.oyees, general labor law.

Prerequisites for examination

Prerequisites for the admission to the 1st State Examination in Law:

- Proof of participation in lecture courses
  a) in required subjects and chosen electives
  b) in legal history, constitutional history and jurisprudence
  c) in economics and possibly public finance (certificates for these courses may be required)
- Proof of successful participation in an advanced test in each of the following: Civil law, criminal law and public law; in general these courses require successful previous participation in pertinent tests for beginners;
- Proof of successful participation in 1 exercise course in another subject;
- Participation in a period of practical studies of between 4 and 8 weeks (varying between the states Länder) at a court and in a government office.

APPENDIX 17. Contents of Curriculums in Law continued

Procedure and extent of examinations	*Written examination:* 8 proctored essays on subjects taught in the required courses or the selected electives *or* 3 or 4 proctored essays on subjects taught in the required courses or the selected electives and a major paper *(Hausarbeit)* to be written within 4 to 6 weeks. *Oral examination:* On the material taught in the required courses and the selected electives.

APPENDIX 18. Contents of Curriculums Leading to the Diplom Examination (Selected Examples)

I. Natural Science and Mathematics

	1st segment of studies (1st through 4th semester) ending with the intermediate examination *(Diplomvorprüfung)*	2nd segment of studies (4th through 8th semester) ending with the *Diplom* examination *(Diplom-Hauptprüfung)*
Biology		
Contents of studies	1. Botany (emphasis on general biology) 2. Zoology 3. Chemistry 4. Physics (or another subject basic to the natural sciences)	1. Botany 2. Zoology 3. General biology (genetics, developmental physiology, cytology and similar subjects) 4. Microbiology 5. Anthropology
	Mathematics for science students and experimental physics (lab courses)	At least 1 minor from mathematics or chemistry or physics
		Academic degree: *Diplom-Biologe* (Dipl.-Biol.)
Biological Chemistry	Principles of physics, biology and human anatomy, inorganic, organic, physical, biological chemistry	1. Biological chemistry 2. Organic or physical chemistry 3. 1 elective (e.g. from physics, chemistry, biology, pharmacology, genetics, immunology)
Contents of studies		
		Academic degree: *Diplom-Biochemiker* (Dipl.-Biochem.)
Chemistry	Principles of inorganic and analytical chemistry, organic chemistry, physical chemistry, experimental physics	Inorganic chemistry, organic chemistry, physical chemistry
Contents of studies	Evidence of knowledge in mathematics for chemists	Academic degree: *Diplom-Chemiker* (Dipl.-Chem.)

APPENDIX 18. Contents of Curriculums Leading to the Diplom Examination (Selected Examples) continued

Geography Contents of studies:	Major: Geography 1st minor: parts of geology or meteorology or botany 2nd minor: parts of history or sociology or ethnology or economics	Major: Geography 1st minor: from the areas of administration, planning, and general cultural studies 2nd minor: from the areas of cultural technology, field research and surveying Subject-related requirements for admission to examination: geographic excursions, more extensive work in cartography, exercises on maps, possibly practical training. Academic degree: *Diplom-Geograph* (Dipl.-Geogr.)
Geophysics/ Meteorology/ Oceanography	Contents of studies: General principles of 1. Mathematics 2. Experimental physics 3. Theoretical physics 4. Principles of geophysics (or meteorology or oceanography)	*Geophysics:* 1. Geophysics 2. Physics 3. Elective (math., science, engineering) 4. Elective *Meteorology:* 1. Meteorology 2. Theoretical meteorology 3. Physics 4. Geophysics or oceanography (or other elective) *Oceanography:* 1. Oceanography 2. Physics 3. Mathematics (or theoretical physics or theoretical oceanography)

APPENDIX 18. Contents of Curriculums Leading to the Diplom Examination (Selected Examples) continued

		4. Elective from areas of mathematics, science, engineering
	Academic degrees: *Diplom-Geophysiker* (Dipl.-Geophys.), *Diplom-Meteorologe* (Dipl.-Met.), *Diplom-Ozeanograph* (Dipl.-Ozeanogr.)	
Geology-Paleontology	1st segment of studies	2nd segment of studies
Areas of studies	Principles of 1. Geology and paleantology 2. Mineralogy and petrography 3. Experimental physics or inorganic chemistry or mathematics 4. Zoology or botany or physical geography	1. General geology 2. Regional and historic geology 3. Elective: applied geology/hydrogeology/mining geology/paleontology/petrology 4. Elective: petrology/geophysics/botany
Subject-related prerequisites for exam	Excursions, field work	Independent geological cartographic work
		Academic degree: *Diplom-Geologe* (Dipl.-Geol.)
Computer Science	1. Mathematics I 2. Mathematics II 3. physical and electronic principles of data processing 4. Principles of computer science 5. Minor or group of supplemental fields	1. Computer science I 2. Computer science II 3. Mathematics 4. Minor or group of supplemental subjects
Areas of studies		Academic degree: *Diplom-Informatiker* (Dipl.-Inform.)
Mathematics	1. Analysis 2. Basic structures, linear algebra with analytical geometry	1. Mathematics I (mainly pure mathematics) 2. Mathematics II (mainly applied mathematics)
Contents of studies		

APPENDIX 18. Contents of Curriculums Leading to the Diplom Examination (Selected Examples) continued

	1st segment of studies	2nd segment of studies
	3. Practical mathematics (e.g. numerical math, theory of probability, statistics) 4. Physics or economics (or bus. admin.)	3. Mathematics III (special area of mathematics) 4. Minor (= 4th subject of intermediate examination) Academic degree: *Diplom-Mathematiker* (Dipl.-Math.)
Physics Contents of studies	1. Experimental physics 2. Theoretical physics 3. Mathematics 4. Chemistry	1. Experimental physics 2. Theoretical physics 3. Applied physics (one course on the application of physics to a wide range of other areas) 4. One elective from areas of mathematics, sciences, engineering Academic degree: *Diplom-Physiker* (Dipl.-Phys.)
II. Economics and Social Sciences (selected examples)		
Business Administration Contents of studies	Principles of business administration, economics law, statistics, – Principles of accounting (course certificate) – Mathematics for economists (course certificate)	1. General business administration 2. Elective from special area of bus. adm. 3. Elective from special area of business administration. 4. Economics 5. Required elective (e.g. law, statistics) Academic degree: *Diplom-Kaufmann* (Dipl.-Kfm.)

APPENDIX 18. Contents of Curriculums Leading to the Diplom Examination (Selected Examples) continued

	1st segment of studies	2nd segment of studies
Education Contents of studies	– Education (Educational anthropology and social conditions of education, theory of educational processes and of socialization, institutions and organizational form of the educational system) – Psychology (General psychology, development psychology, social psychology, psychology of learning and teaching) – Sociology (General sociology, family, youth, education and society) Courses in juvenile law, labor law and law relating to education	1. Education I (principles of education, scientific methods, conditions, objectives and forms of education and research) 2. Education II (Elective from: schools/social education/social work/ adult education and non-school education/ vocational education/ institutions for all forms of special education 3. Required elective from area of education studies 4. Psychology or sociology Academic degree: *Diplom-Pädagoge* (Dipl.-Päd.)
Psychology Contents of studies	1. Study of methods 2. General psychology I 3. General psychology II 4. Psychology of childhood and adolescence 5. Differential psychology and research of personality 6. Social psychology 7. Physiological psychology (or physiology relevant to psychology)	1. Methodology (psychological diagnosis, other methods and techniques) 2. Applied psychology 3. In-depth studies (selection of 4 subjects in the 3 areas of emphasis) 4. Another subject belonging to a related discipline Academic degree: *Diplom-Psychologe* (Dipl.-Psych.)

APPENDIX 18. Contents of Curriculums Leading to the Diplom Examination (Selected Examples) continued

	1st segment of studies	2nd segment of studies
Sociology Contents of studies	Principles of 1. Sociology 2. Economics or business administration or economics 3. Statistics 4. Methods of empirical social research	1. General sociology 2. Special sociology in conjunction with empirical social research 3. Economics (or business administration) 4. Elective from social science 5. Elective in a related discipline
		Academic degree: *Diplom-Soziologe*
Economics Contents of studies	Principles of business administration, economics, law, statistics Participation in courses in: methods of accounting, mathematics for economics students	1. Economic theory 2. Economic policy 3. Public finance 4. General business administration 5. Required elective (e.g. law, statistics, econometrics)
		Academic degree: *Diplom-Volkswirt*
Economics for Teachers Contents of studies	Principles of business administration and economics, law statistics Participation in courses in: – Methods of accounting – Mathematics for economics students	Curriculum I: 1. Education (in particular teaching of economics) 2. Business administration 3. Economics 4. Required elective (e.g. law, statistics, business research) Curriculum II: 1. Education (in particular teaching of economics) 2. Business administration 3. Elective as 3rd and 4th subject: German or a

APPENDIX 18. Contents of Curriculums Leading to the Diplom Examination (Selected Examples) continued

	1st segment of studies	2nd segment of studies
		foreign language or history or geography with special regard to their application in business or mathematics Academic degree: *Diplom-Handelslehrer*
III. Engineering (selected examples)		
Architecture Contents of studies	1. Principles of design 2. Principles of construction 3. Principles of history of architecture and art 4. Principles of planning Prerequisites for intermediate examination: excursions and possibly practical training	1. Architectural design 2. Building design theory 3. Urban design 4. Building construction or regional planning 5. up to 3 further (required) electives Academic degree: *Diplom-Ingenieur* (Dipl.-Ing.)
Civil Engineering Contents of studies	Principles of: 1. Mathematics 2. Mechanics 3. Materials science 4. Basic design	Possible areas of concentration: 1. (Industrial) Civil engineering 2. Hydrological engineering 3. Traffic engineering, city and regional planning – Examinations in at least 6 subjects – Prerquisite for exam: practical training Academic degree: *Diplom-Ingenieur* (Dipl.-Ing.)

APPENDIX 18. Contents of Curriculums Leading to the Diplom Examination (Selected Examples) continued

	1st segment of studies	2nd segment of studies
Electrical Engineering Contents of studies	1. Mathematics 2. Physics (incl. mechanics) 3. Chemistry and materials 4. Principles of mechanical engineering 5. Principles of electrical engineering (incl. metrology, introduction into energy technology or communication devices)	1. Theoretical subjects (e.g. theoretical electrical technology, systems analysis, materials, control engineering) 2. Energy technology (machines, high-voltage technology, power systems, convertor technology, power electronics, energy conversion) 3. Communication subjects (e.g. comm. devices, data processing, high-frequency, electronics) From these subjects a minimum of 4 and a maximum of 11 individual subjects will be examined Academic degree: *Diplom-Ingenieur* (Dipl.-Ing.)
Mechanical Engineering Contents of studies	Principles of: 1. Mathematics 2. Mechanics 3. Thermodynamics 4. Physics 5. Chemistry 6. Materials 7. Mechanical engines 8. Electrical engineering Practical training	Theories of engineering Construction Production technologies Production systems Operation technologies Practical training Academic degree: *Diplom-Ingenieur* (Dipl.-Ing.)

APPENDIX 18. Contents of Curriculums Leading to the Diplom Examination (Selected Examples) continued

	1st segment of studies	2nd segment of studies
Planning Contents of studies	Principles of: 1. Social science and economics 2. Environmental sciences 3. Engineering 4. Mathematics and statistics 5. Design and graphic presentation Practical training	1. Theory and methodology of planning 2. Social, legal and economic aspects of planning 3. Elements and topics in planning Academic degree: *Diplom-Ingenieur* (Dipl.-Ing.)
Surveying Contents of studies	1. Mathematics 2. Graphic geometry 3. Physics and selected chapters from mechanics 4. Geology and morphology/soil science and technical botany 5. Principles of civil law, constitutional law, (public) administration, economics 6. Principles of surveying Subject-related prerequisites for admission to intermediate exam: Practical training, participation in exercise courses in mathematics, geometry, physics, geodesy, surveying field work	1. Geodesy/surveying 2. Photogrammetry 3. Computation of adjustments 4. Surveying and mathematical geodesy 5. Geophysical methods and astronomical geodesy 6. Topography and cartography (incl. reproductions) 7. civil and hydrological engineering 8. Real estate administration 9. Agriculture and agricultural reapportionment 10. Planning and law Surveying, field practice, possibly foreign language requirement Academic degree: *Diplom-Ingenieur* (Dipl.-Ing.)

APPENDIX 19. Contents of Integrated Courses of Study Leading to the Diplom (Selected Examples)

1. *Physics*

The chart called "Integrated Curriculum in Physics" shows structure and contents of the integrated course in physics at the Gesamthochschulen in North Rhine–Westphalia; this Y-model does not limit the Gesamthochschulen in their further development, but leaves room for the development of other models (pp. 130–1).

2. *Economics/Business Administration*

The chart "Integrated Curriculum in Economics" shows structure and contents of the integrated course in economics at the Gesamthochschulen in North Rhine–Westphalia by a Y-model at present in use. As explained above for the course in physics, other models may be thought of in the further development of Gesamthochschulen (see pages 132–3).

3. *Architecture, Urban and Landscape/Regional Planning*

Following is the integrated course in this discipline at the Gesamthochschule Kassel in Hesse.

By ordinance of 9/5/1975 the Minister of Education of Hesse has established the integrated courses of study for architecture, urban and landscape/regional planning.

With regard to the structure of the new courses, principles have been formulated which form the basis for the regulations on studies and examinations. These have been submitted by the Gesamthochschule to the Minister of Education in Hesse for his approval.

Studies in the integrated course are divided into:

1. the basic segment (orientation phase)
2. the advanced segment (core curriculum and areas of concentration)
3. the post-graduate courses

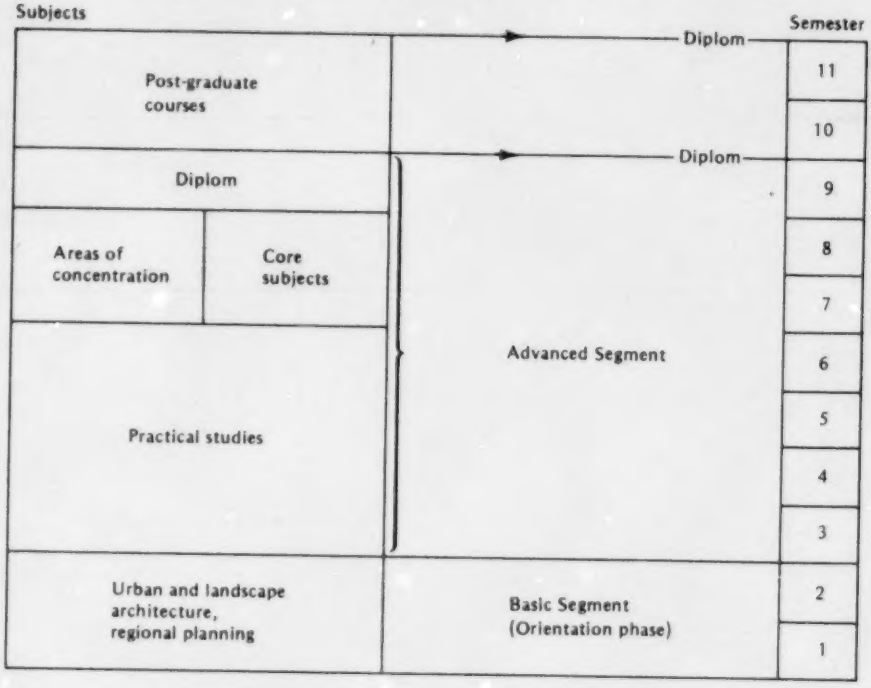
Studies of occupational/professional practical relevance have been integrated into these phases; they are prepared, evaluated and supervised by the Gesamthochschule; they are within the responsibilities of the Gesamthochschule.

The advanced segment ends with a final examination of general professional qualification during the 9th semester. After another 2 semesters of post-graduate work, it can be completed with a final examination of specialized professional qualification or with the preparation of a doctoral thesis.

The Founding Council of the Gesamthochschule Kassel has recommended to the Hessian Minister of Education to award the academic Diplom degree (Dipl.-Ing.) upon completion of the final examination of general professional qualification.

The first examination qualifying for the profession will be offered in the areas of concentration: architecture, urban planning and landscape/regional planning; further concentration and broadening will be possible in architectural planning; building, maintenance, alterations/reconstruction and protection of monuments; landscape planning, urban planning and regional planning.

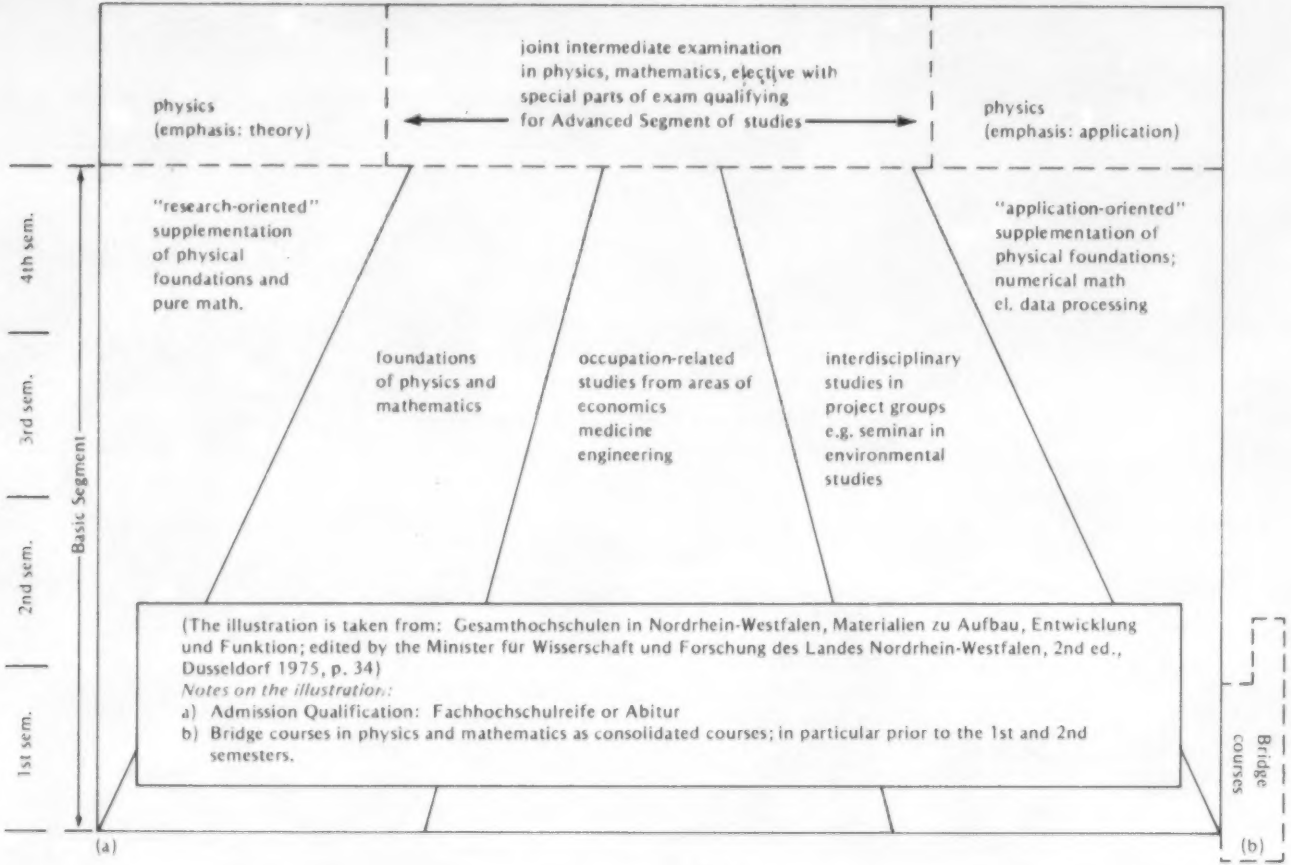
Integrated Course in Architecture, Urban and Landscape/Regional Planning



Requirements for entry:
University qualification (Hochschulreife)
Fachhochschule qualification (Fachhochschulreife)

Model: Integrated Curriculum in Physics

STUDIES TOWARD THE DOCTORATE
Final Exam: "Dipl.-Phys.
continued studies
(Aufbaustudium)
transfer possible to Advanced Segment II
Final Exam: "Dipl.-Phys.-Ing."
8th sem.
7th sem.
6th sem.
5th sem.
Advanced Segment II
physics (in-depth study on a fundamental subject, e.g., adv. statistical mechanics, quantum theory) and mathematics
studies in special areas of physics (e.g., solid state, plasma, medical physics)
studies intensifying basic studies and project groups
physics: applied methods
mathematics: numerical math, el. data proc.
Advanced Segment I



(The illustration is taken from: Gesamthochschulen in Nordrhein-Westfalen, Materialien zu Aufbau, Entwicklung und Funktion; edited by the Minister für Wisserschaft und Forschung des Landes Nordrhein-Westfalen, 2nd ed., Dusseldorf 1975, p. 34)

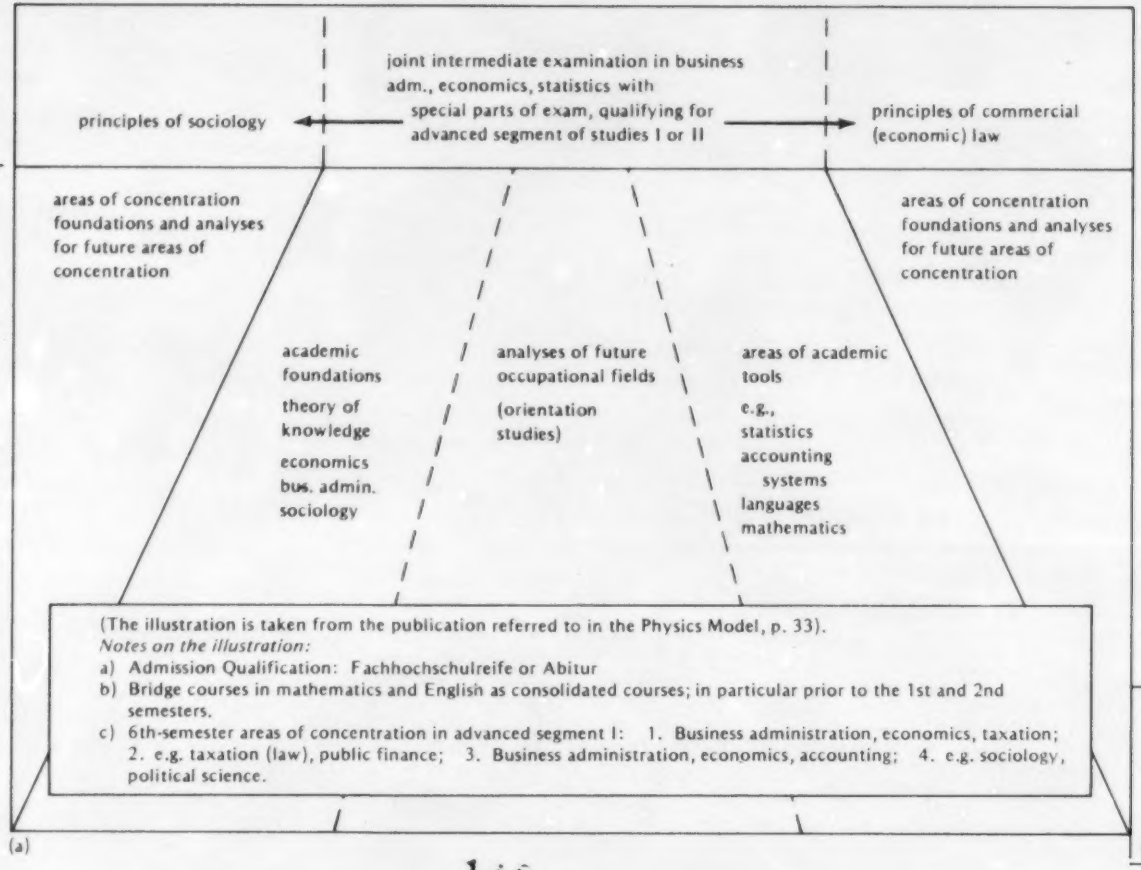
Notes on the illustration:

a) Admission Qualification: Fachhochschulreife or Abitur

b) Bridge courses in physics and mathematics as consolidated courses; in particular prior to the 1st and 2nd semesters.

Model: Integrated Curriculum in Economics

STUDIES TOWARD THE DOCTORATE
Final Exam: "Dipl.-Ökonom"
3 areas of concentration
labor and leisure
market and consumption
planning and organization
requirement: bus. admin., economics, sociology
req. elect.: e.g. social policy, industr. psychology, labor law
requirement: bus. adm., economics, empir. econ. and social research
req. elect.: e.g. sociology or bus. admin. from other area of concentration
requirement: bus. admin., economics, sociology
required electives: e.g. ADP, math, principles in planning and organization
continued studies (Aufbaustudium)
transfer possible to Advanced Segment II
Final Exam: "Dipl.-Ökonom"
2 areas of concentration
finance and investment
management and control
requirement 1.
elective requirement 2.
requirement 3.
elective requirement 4.
required studies
business administration
economics
Advanced Segment I
For requirements 1, 2, 3, and 4, see note (c)
Advanced Segment II
5th sem.
6th sem.
7th sem.
8th sem.



(The illustration is taken from the publication referred to in the Physics Model, p. 33).

Notes on the illustration:

a) Admission Qualification: Fachhochschulreife or Abitur

b) Bridge courses in mathematics and English as consolidated courses; in particular prior to the 1st and 2nd semesters.

c) 6th-semester areas of concentration in advanced segment I: 1. Business administration, economics, taxation; 2. e.g. taxation (law), public finance; 3. Business administration, economics, accounting; 4. e.g. sociology, political science.

APPENDIX 20. Contents of Courses Leading to the Magister Artium Degree (Selected Examples)

1. Linguistics

The Magister examination at the Universität Konstanz is taken in 2 major subjects or in 1 major and 2 minor subjects. (The following information is supplied in accordance with the "Vorläufige Ordnung für die ersten akademischen Abschlußprüfungen an der Universität Konstanz," published in: Amtsblatt des Kultusministeriums Baden-Württemberg, 19 (1970) No. 13, p. 649, and the "Zusatzordnung zur Magisterprüfung für die Fächer im Fachbereich Sprachwissenschaft der Universität Konstanz," published in Amtsblatt des Kultusministeriums Baden-Württemberg, 1974, No. 11, p. 723)

Basic segment

To register for the Magister examination the candidate must submit proof of having passed the *intermediate examination (Zwischenprüfung)* to be taken in the major subject and in a second subject by the end of the 4th semester. The intermediate examination in the Department of Languages is proof of the successful completion of the basic segment in linguistics. The examination consists, in the major or minor subject, of a combination of (a) successive examinations (=course-concomitant), and (b) cumulative examinations (=written and oral examinations at the end of the basic segment).

A. The basic segment in linguistics include the following courses obligatory for all students:

Common base:

Subject		*hours*
Introduction to linguistics		4
Universal grammar I		2
Phonology I Morphology I Syntax I Semantics I	1 of these	2
Linguistic change I		1
Language in social context		1
		10

In addition to these foundation courses the basic segment requires that an area of concentration be elected from the subjects of the department of languages:

Theoretical linguistics (A)
Single-language linguistics (B)
Applied linguistics (C)

Areas of concentration have the following required contents:

APPENDIX 20. Contents of Courses Leading to the Magister Artium Degree (Selected Examples) continued

A: "Theoretical Linguistics," concentration on *Theory of Grammar*

Subject		*hours*
Universal Grammar II		1
Phonology II Morphology II Syntax II Semantics II	1 of these; the pertinent introduction must have been previously studied	2
Phonology I Morphology I Syntax I Semantics I	1 of these which had not been taken as a foundation course	2
Mathematical models I		2
Recent writings on theoretical linguistics		1
		8

B: "Theoretical Linguistics," concentration on *Comparative/Contrastive Linguistics*

	hours
Linguistic change II	2
Germanic or Romance or Slavic linguistic change	1
Recent writings on contrastive linguistics	1
Contrastive Linguistics I	2
Practical comparison (contrastive grammar)	2
	8

C: "Single-Language Linguistics"

	hours
Practical description (structure) two courses from	2
single-language phonology single-language morphology single-language syntax single-language semantics	4
single-language change	2
	8

APPENDIX 20. Contents of Courses Leading to the Magister Artium Degree (Selected Examples) continued

D: "Applied Linguistics"

	hours
Linguistic data processing	2
Statistical linguistics/statistics	2
Field work I	2
Transformations I or psychology	2
	8

If a student is studying one linguistic subject he must take two additional hours in the basic segment; if he is studying two or more linguistic subjects he must take another 7 hours in the basic segment. Contents of these additional hours may be freely elected.

B. The cumulative examination consists in each subject of:

1. Translation of a linguistic text in a foreign language (language to be chosen by the student); as a proctored written examination of two hours;
2. Paper on a problem from the basic linguistic segment, either as a proctored written examination of two hours or as a term paper to be submitted within one month, and
3. An oral examination of half an hour on a subject of the basic segment in linguistics.

The examination is evaluated on a "pass/fail system."

Advanced segment

The Department of Languages at the Universität Konstanz offers courses for the second segment in the following areas:

Area	*Hours*	*Subject*
Recent writings on phonology	2	A
Recent writings on theory of grammar	2	A
Semantics II	4	A
Universal grammar II	1	A
Theory of acquisition	2	A
Mathematical models I (algebraic)	2	A
Structural grammar	2	A
Transformational grammar	2	A
Translation theory I	2	A
Theory on communication systems I	1	A
Theory on communication systems II	1	A
Foundations and history of problems in linguistics	2	A
Normation and construction	1	A
Generative grammar I	2	A

APPENDIX 20. Contents of Courses Leading to the Magister Artium Degree (Selected Examples) continued

Area	*Hours*	*Subject*
Language in social contexts II	2	A
Textual linguistics I	2	A
Theory of linguistic change	2	B
Recent writings on contrastive linguistics	2	B
Sample of contrastive linguistics	1	A
Germanic / Romance / Slavic — linguistic change	2	A,B
Germanic / Romance / Slavic — contrasts/comparison	1	A,B
Language in social contexts I	2	C
Linguistic data processing II	2	C
Linguistic data processing III	2	C
Statistical linguistics	2	C
Dialects (partial languages)	1	C
Special languages		
Stile/stilistic languages		
Linguistic planning	1	C
Transformations	2	C
Single-language phonology	2	B,C
Single-language morphology	2	B,C
Single-language syntax	2	B,C
Practical language description (English, French, Russian, German phonology or morphology or syntax or semantics)	2	B,C

Subject A: Theoretical Linguistics
Subject B: Single-Language Linguistics
Subject C: Applied Linguistics

If the student has chosen one of the mentioned subjects (A,B,C) as *major subject* in the Magister examination, he must submit proof of successful participation in 8 courses of the areas mentioned.

The *written* Magister examination in linguistics consists in a major paper *(Magisterarbeit)* showing the independent investigation of an area of the discipline.

The *oral* examination for the major subject requires:

- Familiarity with the methods, the terminology of linguistics and with the problems of the examination subject,
- Thorough knowledge in, and independent comments on, three of the above-mentioned subjects of the advanced segment in the department of languages.

APPENDIX 20. Contents of Courses Leading to the Magister Artium Degree (Selected Examples) continued

2. English Philology

At the Universität Regensburg the Magister examination can be taken in the Faculty of Arts (Philosophische Fakultät) in a major and a 2nd subject or in a major and 2 partial subjects. (Information according to the "Magisterprüfungsordnung der Philosophischen Fakultät der Universität Regensburg," published in Amtsblatt des Bayerischen Staatsministeriums für Unterricht und Kultus," 1970, No. 23, p. 627, and "Fachprüfungsordnung für das Fach englische Philologie zur Ordnung für die Akademische Abschlußprüfung (Magisterprüfung) in der philosophischen Fakultät der Universität Regensburg," published in "Amtsblatt des Bayerischen Staatsministeriums für Unterricht und Kultus," 1973, No. 17, p. 1057)

The subject English philology is divided into three subjects:

English language/linguistics
English literature
American literature

Among the subject-related prerequisites for admission to the examination (to be fulfilled during the 8 semesters of studies) are the following:

- Certificate of examination in Latin ("kleines Latinum") or equivalent Latin proficiency
- Successful participation in at least one advanced exercise course (Hauptseminar, Oberseminar) each for 2 of the 3 partial subjects. Successful participation has to be certified on the basis of a term paper or an oral examination.

The requirements for the 3 subjects in the **Magister examination** have been established as follows:

1. English language/linguistics:
   a. Familiarity with the linguistic description in method and application to selected areas of current English, in any case by including problems of phonetics and grammar. Knowledge of main differences between British and American English.
   b. Knowledge of the most significant structural changes of the English language in the course of its history. Capability to translate (with dictionary) and to discuss linguistically a text in old or middle English.
2. English literature:
   a. Familiarity with the methods of literature and working with texts.
   b. Knowledge of the major epochs of English literary history on the basis of selected readings. Familiarity with works of contemporary literature. More thorough knowledge of chosen areas of concentration of English literary history including knowledge of the most significant cultural, social and political conditions of the period.

APPENDIX 20. Contents of Courses Leading to the Magister Artium Degree (Selected Examples) continued

3. American literature:
   a. Familiarity with the methods of literature and working with texts.
   b. Knowledge of the major epochs of American literary history on the basis of selected readings. Familiarity with works of contemporary literature. More thorough knowledge of chosen areas of concentration of American literary history including knowledge of the most significant cultural, social and political conditions of the period.

For the **written** examination students who have English philology as a *major* must submit a thesis (Hausarbeit); in this thesis the student must demonstrate that he can describe and evaluate an independent, scientifically founded judgment on a problem of the discipline. The paper may be written in German or English. In a proctored examination (Klausur) of four hours, to be given in German or English, the student shall furthermore show that he can handle a problem of the discipline with academic comprehension. If English philology is a *second subject*, the written examinations are waived.

Oral examinations are required in two of the three subjects of English philology; the standards are differentiated in accordance with the combination of disciplines (i.e. whether English philology is taken as a major or a minor).

Candidates having English philology as their major have their orals in *two* areas of concentration using one of the three subjects on which the topic of the thesis had been based. An additional oral examination is based on a second of the three subjects.

APPENDIX 21. Contents of Courses at Fachhochschulen (Selected Examples)

1. Engineering/Electrical Engineering

Curriculum of Fachhochschule Hannover/Niedersachsen.
The following is the curriculum for energy technology.

The basic segment is the same for all three areas of engineering: energy technology, computer technology, and communication technology, and is completed with the preliminary examination (Vorprüfung). Differentiation follows after the 3rd semester.

(Excerpt from: Fachhochschule Hannover – Studienführer Wintersemester 1975/76, pp. 54, 55)

1. *Basic segment*

		credit hours/week											
No.	*Subject*	*1st*		*2nd*		*3rd*		*1st–3rd*		*semesters*			
	Required Subjects												
1.	Mathematical foundations	4		–		–		4					
	(advanced) mathematics I	4		–		–							
	(advanced) mathematics II	–		6		–							
	(advanced) mathematics III	–		–		6		16					
2.	Digital techniques	–		–		4		4					
3.	Physics I	6		–		–							
	Physics II	–		6		–							
	Physics III	–		–		4		16					
4.	Chemistry	4		–		–		4					
5.	Materials of electrical engineering	–		4		–		4					
6.	Electr. principles I	6		–		–							
	Electr. principles II	–		6		–							
	Electr. principles III	–		–		6		18					
7.	Electr. metrology I	–		–		2		2					
8.	Statics and strength I	2		–		–		–					
	Statics and strength II		6		4			8		6			
9.	Machine design I	–		4		–							
	Machine design II	–		–	6		4	10		8			
10.	Production	–		–		4		4					
11.	Legal aspects	2		–		–		2					
12.	Economics	–		4		–		4					
13.	Physics laboratory	–		–		2		2					
14.	Metrology laboratory I	–		–		2		2					
15.	English		4	–		–				4			
	Total of hours/week	28	32	36	34	36	34	100					
	Number of course certificates	7	8	7		9		23		24			
	Electives												
	Mathematics IV	2		–		–		2					
	French	–		2		2		4					

APPENDIX 21. Contents of Courses at Fachhochschulen (Selected Examples) continued

2. *Main Segment:*
Energy technology

No.	Subject	credit hours/week					
		4th sem.		5th sem.		6th sem.	
		AH*	MR*	AH	MR	AH	MR
1.	Theory of electrical engineering I	4		–		–	
	Theory of electrical engineering II		2	–		–	
2.	Electr. metrology II	2		2		–	
	Electr. metrology III	–			2	–	
3.	High-voltage technology I	2		4		–	
	High-voltage technology II	–		–		1	–
4.	Construction I	2		2		–	
	Construction II	–		3	–	–	
5.	Energy conversion I	8		–		–	
	Energy conversion II	–		3	4	–	3
6.	Electronics I	–		–		3	4
7.	Power systems I	4		–		–	
	Power systems II	–		4		–	
	Power systems III (controls)	–		–		4	
	Power systems IV (controls)	–		–		2	–
	Power systems V (lights)	–		–		2	
8.	Communication devices I	6		–		–	
	Communication devices II	–		4		–	
	Comm. dev. III (waves)	–		–		2	
	Comm. dev. IV (ind. electronics)	–		–		–	2
9.	Control engineering I	–		6		–	
	Control engineering II	–		–		–	4
10.	Machine design	–		–		4	–
11.	Operation of plants	–		–		3	
12.	Laboratory, el. metrology II	2		–		–	
13.	Laboratory, high voltage	–		–		3	2
14.	Laboratory, energy conversion I	–		4		–	
	Laboratory, energy conversion II	–		–		–	2
15.	Laboratory, power systems	–		–		2	–
16.	Laboratory, Communic. dev.	–		–		2	2
17.	Laboratory, control engineering	–		–		2	2
	Total of hours/week	30	32	32	32	30	28
	Number of course certificate	5	6	9	9	12	11

* AH = Power systems and high voltage
MR = Machines and control systems

APPENDIX 21. Contents of Courses at Fachhochschulen (Selected Examples) continued

2. Economics

Curriculum of the discipline Economics of the Fachhochschule Wiesbaden/ Hessen.
(Excerpt from: Gemeinsamer Studienführer der Hessischen Fachhochschulen; Part II: Informationen für Studierende der hessischen Fachhochschulen, Wiesbaden 1976, pp. 144 and 145)

1st, 2nd and 3rd semesters
W = *Electives*

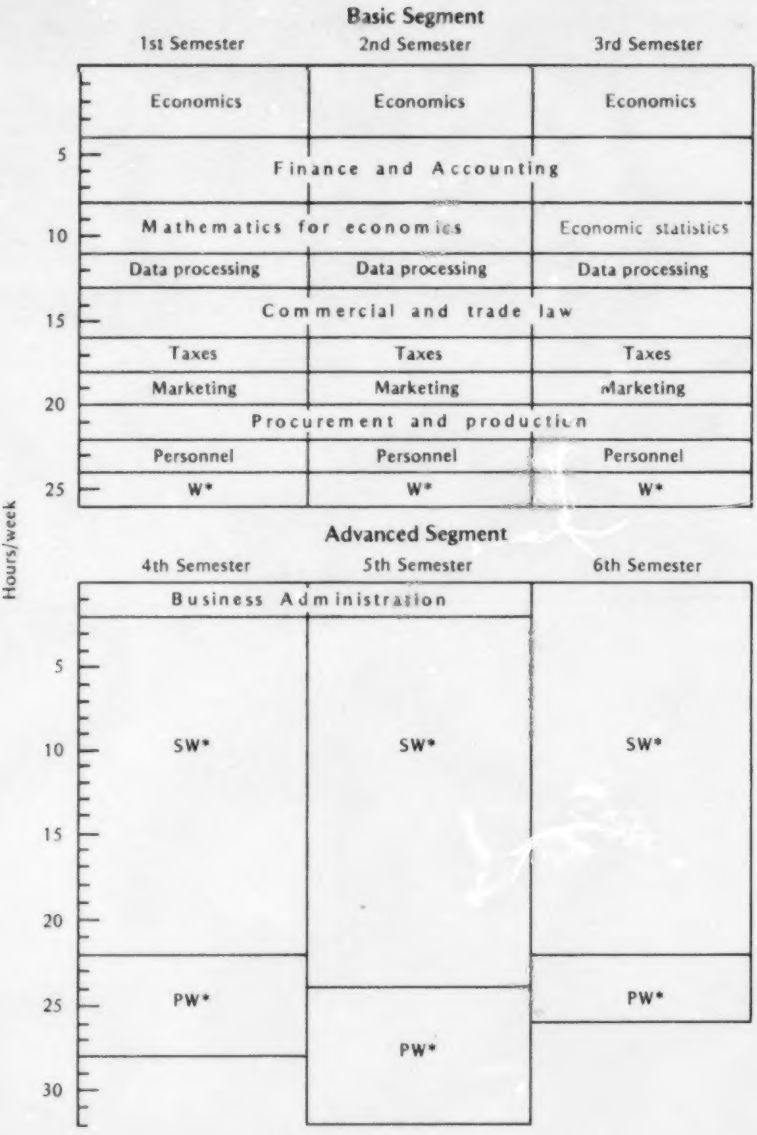
- Sociology
- Political science
- Mathematics (crash course)
- Psychology
- English
- Rhetoric

Additional tests if required and in accordance with resolutions of the departmental conference.

4th, 5th and 6th semesters
SW = Areas of concentration

- Area I
- Industrial Accounting
- Data processing/organization
- Finance
- Planning systems/operations research
- Area II
- Tax law
- Economic (Commercial) Law/procedural law
- Finance
- Accountancy and entrusted property
- Area III
- Market research/statistics
- Data processing/Organization
- Sales management/pricing policies
- Product management/advertising (sales promotion)

(3 subjects have to be elected from one area)



*See explanation in "Economics: Explanations for Curriculum," in this section.

APPENDIX 21. Contents of Courses at Fachhochschulen (Selected Examples) continued

PW = Required electives
- Economics I
- Economics II
- Data processing
- Economic (commercial) law
- Personnel management I
- Personnel management II
- Operations research

(To be elected either 2 subjects or the 4th subject from the area of concentration.)
(A student must select two of the required electives or a further course from his area of concentration.)

3. Design/Industrial Design

Survey of distribution of hours for the course in Industrial Design at Fachhochschulen in Bayern. The 3rd and 6th semesters are semesters of practical study and, therefore, have not been included in this survey. However, they are part of the course and are taken, under supervision of the Fachhochschule, in firms, governmental agencies and other institutions outside of the Fachhochschulen.
(Excerpt from: Amtsblatt des Bayerischen Staatsministerium für Unterricht und Kultus, No. 19, 1972, p. 1221)

APPENDIX 21. Contents of Courses at Fachhochschulen (Selected Examples) continued

Survey on subjects and hours

No.	Subject (area)	Hours/week in the divisions of studies 1 (1st + 2nd sem)	2 (4th + 5th sem)	3 (7th + 8th sem)
	Design	16	26	36
1.	Design principles	14	–	–
2.	Design theory	2	2	–
3.	Areas of concentration in design (required elective)	–	–	10
4.	Industrial design	–	24	18
5.	Supervised independent works (for terminal exam)	–	–	8
	Skills	22	2	4
6.	Object analysis	6	–	–
7.	Analysis of application	2	1	–
8.	Drawing	8	–	–
9.	Model making	2	–	–
10.	Graphics	4	1	–
11.	Oral communication	–	–	4
	Technology	4	8	–
12.	Mechanical tools (required			
13.	Electrical tools electives)	3	–	–
14.	Machines			
15.	Construction	–	2	–
16.	Materials/materials science	1	3	–
17.	Half-finished products & elements	–	1	–
18.	Production and inspection	–	2	–
	Economics	–	2	4
19.	Economics/Bus. Adm.	–	1	–
20.	Marketing	–	1	2
21.	Laws and norms	–	–	2
	Sciences	8	10	2
22.	Natural sciences	4	–	–
23.	Humanities	–	2	–
24.	Gestaltpsychology & Aesthetics	–	1	–
25.	History of art and design	–	3	–
26.	*Required electives in other academic fields*	4	4	2
	Free electives (not within Nos. 5 and 26)	10	10	10
	Minimum number of credit hours/week	60	58	56

APPENDIX 22. List of Official Doctoral Degrees Awarded by Universities/ Doctorate-Granting Institutions in the States of the Federal Republic of Germany[1]

(as of July 1977)

Doctor of:		*Abbreviation:*
– Arzneimittelkunde (Pharmacology	Doctor pharmacarum	Dr. pharm.
– Bergbauwissenschaften (Mining)	Doctor rerum montanarum	Dr. rer. mont.
– Betriebswirtschaftslehre (Business Administration)	Doctor oeconomiae	Dr. oec.
– Forstwissenschaft (Forestry)	Doctor forestis	Dr. forest.
	Doctor rerum forestalium	Dr. forest.
	Doctor rerum silvestrium	Dr. rer. silv.
– Gartenbauwissenschaft (Horticulture)	Doctor rerum hortensium	Dr. rer. hort.
– Ingenieurwissenschaft (Engineering)	Doctor Ingenieur	Dr. – Ing.
– Landwirtschaft (Agriculture)	Doctor rerum agrarium	Dr. rer. agr.
	Doctor agronomiae	Dr. agr.
	Doctor scientiarum agrarium	Dr. sc. agr.
– Medizin (Medicine)	Doctor medicinae	Dr. med.
– Naturwissenschaften (Natural Science)	Doctor philosophiae naturalis	Dr. phil. nat.
	Doctor rerum naturalium	Dr. rer. nat.
	Doctor scientiae naturalis	Dr. sc. nat.
– Pädagogik (Education)	Doctor paedagogiae	Dr. paed.
– Philosophie (Philosophy)[2]	Doctor philosophiae	Dr. phil.
– politischen Wissenschaften (Political Science)	Doctor disciplinarum politicarum	Dr. disc. pol.
	Doctor scientiarum politicarum	Dr. sc. pol.
– Rechte (Law)	Doctor juris	Dr. jur.
	Doctor juris	Dr. jur.
– kanonischen Rechts (Canon Law)	Doctor juris canonici	Dr. jur. can.
– beider Rechte (Common Law and Canon Law)	Doctor juris utriusque	Dr. jur. utr.
	Doctor juris utriusque	Dr. jur. utr.

1. Without claim to completeness.
2. The Dr. phil. degree is awarded in most humanities disciplines and especially in philology subjects.

APPENDIX 22. List of Official Doctoral Degrees Awarded by Universities/ Doctorate-Granting Institutions in the States of the Federal Republic of Germany continued

(as of July 1977) *Doctor of:*		*Abbreviation:*
– Rechts- und Staats-wissenschaften (Law and Political Science)	Doctor juris et rerum politicarum	Dr. jur. et rer pol.
– Sozialwissenschaften (Social Science)	Doctor disciplinae politicae	Dr. disc. pol.
– Sportwissenschaften (Sports)		Dr. Sportwiss.
– Staatswissenschaften (Political Science)	Doctor rerum politicarum	Dr. rer. pol.
	Doctor oeconomiae publicae	Dr. oec. publ.
– technischen Wissenschaften (Technology Science)	Doctor rerum technicarum	Dr. rer. techn.
– Theologie (Theology)	Doctor theologiae	Dr. theol. oder D.
– Verwaltungswissenschaften (Public Administration)	Doctor rerum publicarum	Dr. rer. publ.
– Veterinärmedizin (Veterinary Medicine)	Doctor medicinae veterinariae	Dr. med. vet.
– Wirtschaftswissenschaften (Economics)	Doctor rerum oeconomicarum	Dr. rer. oec.
– Zahnheilkunde (Dentistry)	Doctor medicinae dentariae	Dr. med. dent.